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ABSTRACT

One of a set of high school curricula on nuclear issues, this 10-day science unit helps students understand the interrelationship between the economy, the arms race, military spending, and the threat of nuclear war. Through activities such as role playing, discussion, brainstorming, and problem solving, students develop their ability to evaluate issues and information in order to make educated decisions. Topics covered in the 10 lessons are: the background of nuclear weapons; individual and current world conflicts; weapons; the biological and ecological effects of a nuclear explosion; Hiroshima; radiation; civil defense; nuclear proliferation; perceptions of national security, resources, and a healthy economy; and military spending. In a culminating activity, students are encouraged to express their feelings and explore ways they can affect society. Each lesson includes a plan sheet, readings, student activities, and a homework assignment. Additional materials include an evaluation form; bibliography; and lists of informational, instructional, and audiovisual materials. (LP)

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CROSSROADS

Quality of Life in a Nuclear World

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A High School Science Curriculum

by
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• Jobs with Peace Education Task Force •

SO 015 433

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Jobs with Peace is a nationwide organization that examines the effects of the nuclear arms buildup, foreign military intervention and military spending on our everyday lives. The Education Task Force of Jobs with Peace is composed of teachers in a variety of educational activities.

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CONTENTS

Introduction 1
Evaluation 3
Overview 4
DAY 1: Introduction to Nuclear Weapons 6
Worksheet 1a: Headlines 8
Worksheet 1b: Manhattan Project—Beginning of the Bomb 9
Worksheet 1c: Manhattan Project—Reactions to the Dropping of the Bomb 10
Worksheet 1d: Situations in Scientific Research 11
DAY 2: Conflicts and War 13
Worksheet 2a: Individual Conflicts 15
Worksheet 2b: World Map 16
Worksheet 2c: Countries at War and Why 18
Teacher Resource Sheet 2d: The Dollar Game 20
DAY 3: Weapons and the Nuclear Bomb 21
Worksheet 3a: From Rocks to Nukes 23
Worksheet 3b: Weapons Information Sheet 24
Worksheet 3c: What is a Nuclear Bomb? 25
Effects of a Nuclear Explosion 26
Worksheet 3d: Boston Area Map 27
Worksheet 3e: The Effects of a One-Megaton Bomb 28
Worksheet 3f: Nukes and More Nukes 29
DAY 4: The Biological Effect of a Nuclear Explosion 30
Worksheet 4a: The Physiological Effects of Radiation 32
Teacher Resource Sheet 4b: Radiation and the Human Body 33
Worksheet 4c: Hiroshima Illustrations 34
Worksheet 4d: Voices of Hiroshima Victims 35
Worksheet 4e: Hibakusha—A-Bomb Survivors 36
Worksheet 4f: Interacting with the Environment 37
DAY 5: The Ecological Effects of a Nuclear Explosion 38
Worksheet 5a: Definitions of Ecological Effects 39
Worksheet 5b: Info. Sheet 1: Radiation's Effect on the Water Cycle and Soil 40
Info. Sheet 2: Radiation's Effect on Food Chains 41
Info. Sheet 3: Radiation's Effect on the Atmosphere 42
Info. Sheet 4: Radiation's Effect on Health 43
Worksheet 5c: Problem 1: Radiation's Effect on the Water Cycle and Soil 44
Problem 2: Radiation's Effect on Food Chains 45
Problem 3: Radiation's Effect on the Atmosphere 46
Problem 4: Radiation's Effect on Health 47
Worksheet 5d: What's Your Nuclear IQ? 48
DAY 6: Civil Defense and Limited Nuclear War 49
Worksheet 6a: What Is Our Civil Defense Plan? 50
Worksheet 6b: Nuclear Alert!! 52
Worksheet 6c: Can We Survive a Limited Nuclear Attack? 55
Worksheet 6d: The Arms Race: Action and Reaction 56
Worksheet 6e: Interpreting the Timeline of the Arms Race 57

DAY 7: Nuclear Proliferation 58
Worksheet 7a: How Many Do You Have? 60
Worksheet 7b: Where the Bombs Are 61
Worksheet 7c: What Should We Spend Our U.S. Dollars On? 62
DAY 8: National Security, Resources and a Health Economy 63
Worksheet 8a: Who Is Stronger? 65
Worksheet 8b: Simulation Role Cards 66
Worksheet 8c: What Is the Purpose of National Security? 68
Worksheet 8d: Directions for Oil Islands Game 69
Worksheet 8e: Community Questionnaire 70
DAY 9: The Environment and Military Spending 71
Worksheet 9a: Our Environment: What Condition Is It In? 73
Worksheet 9b: Budgeting for the Welfare and National Security of our Citizens 74
Worksheet 9c: National Budget Graph 75
Worksheet 9d: The 1983 Budget 76
Teacher Resource Sheet 9e: The 1983 Budget 77
Worksheet 9f: 1982 Budget Cutbacks 78
Worksheet 9g: Programs that Received Increased Monies 79
DAY 10: Putting the Pieces Together 80
Worksheet 10a: Options for National Security 82
Worksheet 10b: Action Sheet 83
Informational and Curricular Materials 84
Audiovisual 85
Bibliography 87

INTRODUCTION

The threat of nuclear war, the economy, the arms race, military spending, and our quality of life are interrelated issues that affect our students deeply. Educators must help their students discuss and understand such important issues. For them to become conscientious and active citizens, we need to develop their ability to evaluate issues and information, so they can make educated decisions. This is true for each applied subject area—science, English, math and social studies.

"I am very scared, very, very scared. Because with a nuclear war you don't have a chance to survive."

"How do we know what is going on? That's what's so scary. It seems like the whole future of the world is in the hands of ten people."

"These days, I just try not to think about my future, because I have a hard time seeing one. I want a good education but we're losing teachers and programs left and right. There aren't any jobs and there isn't any money for me to go to college. I want to do something with my life, but who cares about me? Besides, we're all going to get blown up anyway."

Such statements by high school students express the widespread and profound concern of our youth about the threat of nuclear war to their future lives. They also reflect the confusion and powerlessness students feel in these politically and economically troubled times. Clearly, we must help our students address these issues.

Goals of the Curriculum

This curriculum was developed to inform students of the issues of nuclear war and military spending, and to help them overcome feelings of helplessness and powerlessness. The aim is open discussion. We want to encourage students to make decisions and act on them. Our general goals are:

- To air and deal with students' fears, thoughts and questions about nuclear war
- To understand why individuals, groups and nations have conflicts and to explore methods of resolving them
- To explore reasons for the nuclear weapons buildup
- To understand the effects of a nuclear explosion
- To discuss how military spending affects our economy
- To encourage students to form rational opinions and act on them as productive citizens

Classroom Climate

Teaching about nuclear war can be an extremely sensitive and powerful experience. Students may have strong feelings about some topics discussed. It is important that students feel they can freely express their feelings and views. Teachers can set this tone by:

- Encouraging students to listen to what another says, whether or not he or she agrees with it
- Urging students to share their feelings (Teachers can help by sharing their own feelings.)
- Differentiating between fact and opinion
- Asking questions that help students clarify their own thoughts and feelings
- Encouraging students to continue these discussions with family and friends
- Opening themselves to questions

- Making students aware that they don't know everything about nuclear war and that nobody does

After a heated discussion, stop and assess students' feelings. For each day, provide such an activity. Additional activities you may want to use include the following:

- A whip statement. After a provocative session, give students a phrase and tell them to complete it with the first thing that comes to mind. Go around the room very quickly so they do not stop and think. Say, "This activity makes me feel . . .," having each student finish the statement.
- Ask students to write a "Dear Abby" letter expressing their feelings. Collect the letters, redistribute them for students to answer. Then, recollect them and read the letters and responses aloud.
- Have students quickly write down their feelings after an activity. Go around the room and have students share what they wrote. Then, discuss the thoughts.
- Have students draw pictures of what an activity made them feel. Share and discuss the pictures.

Teaching Approach

The curriculum centers on discussion, roleplaying, brainstorms, and problem-solving. Each lesson plan includes readings and worksheets. There is also a daily homework assignment. Each lesson starts by reviewing the previous night's homework.

We strongly encourage you to have students maintain a journal throughout the two weeks. The journal provides students with an outlet for their feelings and you with a means of evaluation. You can make it part of each night's homework assignment, or you can provide ten minutes at the end of each class for journal-writing. You can allow free expression or suggest specific writing assignments.

The activities of Day Ten are crucial. During the curriculum, some students may feel powerless. It is important to instill a sense that they can affect our society and the world. They need to feel that their opinions and decisions are important. Therefore, they need to be given suggestions about how they can act, whichever side of an issue they may be on. More important, they need to be given the time and encouragement to decide how they will express themselves.

Structure of the Curriculum

"Crossroads" is divided into three units—English, science, and social studies. This allows specific skills to be developed while the issues of nuclear war are addressed.

Each unit is a comprehensive two-week course. However, if time is limited, we encourage you to choose the most appropriate activities and lessons. We also urge you to read all units to find additional activities you like.

Each lesson includes a plan sheet and student worksheets. The lesson plan contains objectives, descriptions, and directions for the day's activities. Students' worksheets contain the readings and worksheets for that day. They are numbered in order of use. For example, Worksheet 3b would correspond to the second activity sheet used in Day Three.

There is a wealth of material available on these issues. A list of resources is in the Appendix. We believe in dialogue and presenting different perspectives. Educators must provide students with as much relevant information as we can to help them formulate their own opinions. Because the curriculum is short, we encourage you to supplement "Crossroads" with additional materials, resources, or speakers.

After your class completes the curriculum, please fill out the evaluation form at the end of this introduction and mail it to us. This will help us make revisions. Also, feel free to contact us if you have any questions or comments. The address and phone number are on the back cover.

EVALUATION

1. Circle the curriculum you used: Social Studies Science English

2. How many students were involved in the curriculum?

3. Did you use the curriculum as a whole or in bits and pieces? Did you include activities from other curricula? If so, which?

4. How many days did you spend on the curriculum?

5. What was the general response of your students?

6. Which activities were most successful for you?

7. Which activities were least successful?

8. What additional types of materials or speakers did you use?

9. Do you have any further comments or criticisms?

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OVERVIEW

Nuclear war—its threat to our environment and society—these issues are in the news every day, posing such urgent questions that no responsible citizen can afford to ignore them.

Science is no longer a field separated from public voice and government decision-making. Developments in science have direct effects on conditions that we live in. As science teachers, part of our task is to explain the principles of current phenomena that are shaping the world, help students to evaluate the effects of these phenomena on our ecosphere, and instill a willingness to act responsibly on those evaluations. The building of nuclear weapons is such a phenomenon.

The following is a general overview of the science unit of *Crossroads*:

Day One: As an introductory activity, students brainstorm what nuclear arms mean to them. They then read a history of the Manhattan Project and debate in two activities the role of science in developing nuclear weapons. Students end the day by reading the reactions of the scientists who built the A-bomb after its first testing.

Day Two: Students define the word *conflict* and examine the kinds of conflicts that individuals get into and the reasons for them. Next students compare conflicts between individuals with conflicts between countries, and then map out those countries currently at war. Finally, students play a simple game that examines the concept of escalation versus cooperation.

Day Three: In this lesson, students learn about the development of the fusion process of today's nuclear weapons and the effects of a nuclear explosion. The concept of a qualitative leap in development of weaponry is explored and students map out the potential effects of a nuclear explosion in their geographical area.

Day Four: Students chart the various biological effects on the human body from a nuclear explosion. They then look at pictures depicting Hiroshima after the bomb was dropped and read quotations from Hiroshima survivors. The lesson ends by students reading about Hiroshima survivors who are making valuable contributions to the world today.

Day Five: Students examine the effects of a nuclear explosion on various components of the environment—the water cycle and soil, food chains, the atmosphere, and health and diseases. They report their findings to the rest of the class via a panel of environmental "experts."

Day Six: Through a "Nuclear Alert!" simulation exercise, students evaluate the viability of this country's civil defense plans. They then debate the possibility of surviving a limited nuclear war.

Day Seven: Students graph out the arms race between the United States and the Soviet Union. They discuss fears both countries might have of the other. Finally, they map out the countries that have or are capable of having nuclear weapons and discuss the implications of worldwide nuclear proliferation.

Day Eight: Students examine the question of nuclear superiority through a roleplay exercise in which a United Nations special commission listens to delegations from the United States and the Soviet Union. They read the goals of the U.S. national security

policies and discuss whether nuclear weapons help to achieve those goals. The lesson ends with students playing a game that deals with arms and natural resources.

Day Nine: Students list various ecological problems, formulate solutions, and discuss why these problems exist. Students simulate decision-making on the formulation of a national budget and compare their results to the proposed 1983 United States budget. They finish by evaluating the effects of 1982 budget cutbacks and gains on society, the environment, and national security.

Day Ten: This day is devoted to summarizing concepts covered and having students formulate and voice views they have formed throughout the unit. They then choose a form of public action to express those views.

DAY ONE:
Introduction to Nuclear Weapons

Objectives

To allow students to express their thoughts and feelings about the threat of nuclear war
To learn some of the history of the development of the atomic bomb
To debate the role of science in developing nuclear weapons

Materials

Photocopies of student worksheets
Newsprint and magic markers

Activities

A. Write NUCLEAR ARMS on the board. Give each student a copy of the collage sheet of headlines (1a). On a separate piece of paper, have students spend five minutes writing down what comes to mind. Then, share what they wrote and list key phrases on the board. Discuss the following:

- Why did these specific thoughts and feelings come to mind?
- What is it like having those thoughts and feelings?
- Why is it important to talk about nuclear weapons?

Tell students that they are going to spend the next two weeks examining nuclear arms, the military, and the possibilities of war.

B. Give each student a copy of the history of the Manhattan Project and the dropping of the atomic bomb on Hiroshima (1b). Read aloud together and discuss the following:

- What is radioactivity?
- What is the process of fission?
- What is a chain reaction?
- What does the equation $E=MC^2$ mean?
- Why do you think the scientists involved in the project were so interested in developing the atomic bomb?
- What do you think their reactions were after the bomb dropped on Hiroshima?
- How much responsibility did the scientists hold for the bombing of Hiroshima and Nagasaki? Why?
- What potential benefits for humankind were there in developing the atomic bomb? What potential drawbacks were there?

C. Write on the board the following sentence: SCIENTISTS SHOULD WORK ON ANY PROJECT, INCLUDING NUCLEAR WEAPONS, BECAUSE IT ADVANCES SCIENTIFIC KNOWLEDGE. Print the following five statements on sheets of newsprint and put them up around the room: STRONGLY AGREE, AGREE, NOT SURE, DISAGREE, STRONGLY DISAGREE. Ask students to read the statement on the board and then stand next to the phrase that best expresses their opinion about the statement. Give each group a few minutes to discuss why they chose that position. Each group should also choose a spokesperson. After the discussion time is over, the five spokespeople should present to the rest of the class each group's perspectives. Then, allow students to ask questions of any group they choose and to respond to each other's positions. When the exercise has ended, ask students if anyone has changed his or her mind based upon the discussion. If so, they should change groups so people can see.

D. Give each student a copy of the reactions of scientists in the Manhattan Project to the dropping of the atomic bomb, both in desert testing and on Hiroshima (1c). Discuss:

- What were the different reactions of the scientists?
- Do you think any felt differently at the end of the project than at the beginning? If so, how?

E. Divide students into groups of four to eight students. Give each student a copy of the "What Decision Should They Make?" worksheet (1d). Have each group read through each situation and decide whether or not they, as scientists, would develop the scientific idea, considering the risks involved to humankind. After ten to fifteen minutes of group discussion, reconvene the groups. With each situation, students from the different groups should voice the decision their group arrived at and why they made that particular decision. Discuss:

- Is there a point at which the potential dangers to society outweigh the potential benefits and scientific research should be discontinued? If so, what is that point? If not, why not?

F. Homework: Students are given two assignments.

Introduce students to writing a journal (see Introduction). Explain that the journal can serve as a means of recording their thoughts and feelings from the day's lesson. If you are going to use it as a method of grading students for the unit, make sure you tell them this.

Tell students to go through the newspaper and pick out three conflicts occurring between countries in the world today. They should identify the conflict and how the two countries are dealing with it (negotiating, cutting off relations, at war).

Notes:

1a

US bombers based in Britain pose problem in talks with Soviet Union

nuke for every neighborhood

Soviet says leadership is willing to examine Reagan missile offer

Soviets still work on missile sites, US aide says

Nuclear insanity

nuclear weapons

Into the nuclear depths

'Each side now possesses such a massive amount of overkill that a numerical parity in warheads or throw weight, or even qualitative advantage, loses much of its relevance. The number of nuclear weapons might be important were we dealing in tens, but they have little relevance when we are dealing in thousands.'

- George Ball

Hiroshima survivors bring nuclear realities to Senate

Stakes too high for N-freeze, says Haig

US was ready to use N-bomb to hold Berlin in 1959, papers show

Soviet scientist warns of atom war's peril

8

THE MANHATTAN PROJECT

The Beginning of the Bomb

Nuclear energy was discovered by Henri Becquerel in France in 1896. He found that ores containing uranium gave off rays of energy—it was RADIOACTIVE. Atoms, the smallest unit of matter, are made up of a dense, central nucleus filled with protons and surrounded by a system of electrons. It was soon realized that enormous amounts of energy were locked up in the nuclei of atoms, amounts of energy a million times greater than those released in ordinary chemical processes.

For the next forty years, scientists in many countries tried to figure out a way they could control the release of this massive energy source. Enrico Fermi of Italy found that atoms of some elements could be split into other atoms. Finally, in December of 1938, two German scientists, Otto Hahn and Fritz Strassman, split the uranium element in two. This process of splitting one element into two elements was named FISSION. They also realized that if they could keep this splitting going, it would build into a CHAIN REACTION. As a result of this chain reaction, there was a loss of matter or mass. Albert Einstein explained where this mass went with his famous equation $E=MC^2$.

He determined that the lost mass from the fission was converted to energy equivalent to the mass of the material multiplied by the speed of light—an enormous number. Nuclear physicists all over the world quickly realized that this discovery could make it possible to produce either enormous explosions or electric power.

But in September of 1939, the Nazi armies began to roll and the world was plunged into war. Nuclear research programs in most European countries were forced to discontinue or transfer to Canada and eventually to the United States. On December 6, 1941, the day before Pearl Harbor, President Roosevelt's chief scientific aide signed a report declaring the atomic bomb to be feasible and recommended a crash program for its development. In the latter half of 1942, the MANHATTAN PROJECT was formally instituted.

The main research center for the Manhattan Project was established in 1943 at Los Alamos, New Mexico. The director was Robert Oppenheimer, previously a professor at the University of California in Berkeley. The scientific teams that came to work at Los Alamos were talented and numerous. Some scientists came because they wanted the Allies to develop the bomb before Hitler's forces did. Others wanted to see an end to the war. And others wanted to be part of scientific history in the making.

Enormous amounts of dollars were poured into the project. They had no computers then to predict how big the bang might be. Some thought the blast would equal a kiloton of TNT. But the first test surprised everyone: it equaled approximately 20 kilotons of TNT.

In August of 1945, two atom bombs were exploded over two Japanese cities, Hiroshima and Nagasaki. The explosions produced a temperature of 10 million degrees—unheard of on earth. As many of 140,000 people in Hiroshima and 70,000 in Nagasaki died on the day of the attack or in the weeks immediately following, and the death toll rose by another 130,000 or so before five years had elapsed. Hundreds of thousands of others, of course, were severely hurt, some of them never to recover, and to this day people die from injuries or illnesses that can reasonably be traced to the effects of the bomb.

Excerpted and paraphrased from *The Advisors: Oppenheimer, Teller And The Superbomb*, by Herbert York, and the article "A Final Accounting Of The Death and Destruction," by Kai Erikson (©1981 by the *New York Times*).

THE MANHATTAN PROJECT:

Reactions to the Dropping of the Atom Bomb

The following statements were made by scientists who helped develop the atom bomb soon after its first testing in Los Alamos, New Mexico. Think about their different reactions and imagine, in comparison, how you think they might have felt at the beginning of the project.

"I am become death, destroyer of worlds."

Robert Oppenheimer, director of the Manhattan Project, quoting the Hindu *Bhagavad Gita*

"What the last human being on earth will see is what we have seen this morning."

George Kistiakowsky, head of the explosive division

"I am unhappy to admit that during the war—at least—I did not pay much attention to this (i.e., the "moral or humane" problems of the atomic bomb). We had a job to do and a very hard one. The first thing we wanted to do was get the job done. . . . Only when our labors were finally completed when the bomb dropped on Japan, only then or a little bit before then, maybe, did we start thinking about the moral implications."

Hans Bethe, scientist

"What a thing we've made!"

Bob Wilson, scientist

"The whole country was lighted by a searching light with the intensity many times that of the midday sun. It was golden, purple, violet, gray, and blue. It lighted every peak, crevasse and ridge of the near-by mountain range with a clarity and beauty that cannot be described. . . . Thirty seconds after the explosion, came . . . the strong, sustained, awesome roar which warned of doomsday and made us feel that we puny things were blasphemous to dare tamper with the forces heretofore reserved to the Almighty. . . ."

Brigadier General Farrell, army officer, who worked closely with the Los Alamos scientists

SITUATIONS IN SCIENTIFIC RESEARCH:

What Would You Decide?

Read the following situations together as a group. Each situation deals with a dilemma in scientific research—a point at which scientists were faced with developing something that had both advantages and disadvantages to the world. They faced the decision whether the product had enough advantages to be beneficial to humankind. For each situation, decide whether you would develop the product or discontinue the research. Be prepared to support your decision with reasons.

1. For a long time, scientists have been very interested in finding a way to produce cheap, synthetic forms of substances that are produced within the human body, and in finding a way to reduce the possibilities of someone being born handicapped in any way. They want to learn how, after reproducing genes and isolating them, to use these genes in drugs or in the fertilized eggs of people who have histories of disease or handicaps, to ensure healthy children. This is called cloning.

The advantages of this discovery could be tremendous. Expensive and difficult-to-obtain forms of medicine like insulin could be produced synthetically and cheaply. A couple with genetic diseases and handicaps could be assured of a healthy baby. At the same time, there have been many outcries. People have charged that such a discovery could be very dangerous, especially in the hands of a few scientists. It could be used to experiment on unsuspecting people. There is no telling what could happen to a baby who has been given cloned genes. Governments could use it in harmful ways to control a population. If you were on the research team, what would you decide?

Continue the research:

Continue with restrictions:

Discontinue the research:

2. Scientists have long been interested in regulating the human brain in order to help deal with processes such as depression, learning problems, appetite control, sleeplessness, and fertility. Recently, researchers have discovered a family of chemicals in the human brain called neuropeptides, or neurotransmitters. These chemicals transmit messages from neuron to neuron to receptors in the brain in order to increase nerve cell receptivity to all of these processes. Therefore, an increased number of a certain type of neuropeptides in your brain could increase your learning or your sleep or other body processes. Scientists are now working on producing synthetic neuropeptides that last long enough when ingested to reach the brain.

The advantages are that many problems such as those listed above could be more effectively controlled and solved. The disadvantages are that an even larger drug market could be created in a society that already deals with the stress and strain of life by consuming far more drugs than any other country in the world. These drugs could be used to pacify people, or be used on people who don't know what is being given to them. What would you choose to do as a research scientist?

Continue the research:

Continue with restrictions:

Discontinue the research:

3. Scientists in the late 1950s and early 1960s were trying to develop a chemical that would keep plant growth down without having to constantly maintain an area (such as shrubbery around powerlines and railroad tracks). What they developed was a defoliant that came to be known as Agent Orange—a chemical that when sprayed on vegetation would kill it. The advantage to this chemical was that it could be sprayed on certain areas to inhibit growth with minimum maintenance. Agent Orange was later used as an effective weapon in the Vietnam War, where it defoliated the jungles capable of camouflaging both civilian and military populations. The disadvantages were that the chemical contained dioxin, which is toxic to animals, including humans, and could cause cancer. What would you have done as a research scientist?

Continue the research:

Continue with restrictions:

Discontinue the research:

DAY TWO:

Conflicts and War

Objectives

To understand the concepts of conflict, escalation, and resolution
To explore reasons for conflicts between individuals and between countries, and to explore various forms of conflict resolution for both

Materials

Photocopies of student worksheets
Dollar bill

Activities

A. Explain to students that in order to talk about war we must talk about conflicts, how they arise, and how they can be resolved. Write on one half of the board CONFLICT. Ask students to define it (*American Heritage Dictionary*: a controversy, disagreement, opposition). Then, on the other half of the board write RESOLUTION, and ask students to define it (*American Heritage Dictionary*: a course of action determined or decided upon). Give each student a copy of the "Conflicts between Individuals" worksheet (2a). Ask students to write down three typical conflicts that happen between individuals (borrowing money, breaking something owned by someone else, arguing over who is right), and then three possible resolutions for each conflict. Allow five to ten minutes for completion. Ask students to read aloud the conflicts they chose and the possible resolutions for each, and write them on the board in the appropriate columns. When the board is filled, discuss the following:

- Are there any similarities between the conflicts listed? If so, what?
- Pick one of the conflicts listed and focus on the three possible resolutions. Which one would be the most constructive? Why? Which would be the least constructive? Why?
- Go through several more conflicts in the same way. Are there any similarities in the constructive resolutions? If so, what are they?

Write the word ESCALATE on the board and ask students to define it (*American Heritage Dictionary*: to increase or intensify). Ask students to identify the conflicts that escalated.

- Are there any similarities in the resolutions reached after a conflict escalated? If so, what are they?

B. Erase the board, leaving just the headings. Ask students what kinds of conflicts countries have with each other and write them under CONFLICTS (border disputes, one country trying to take over another country). Then, ask students to list different resolutions that countries use to resolve their conflicts, and write these on the board under RESOLUTIONS. Discuss:

- Are there any similarities between conflicts countries have and conflicts between individuals? If so, what are they?
- Which are constructive resolutions? Which resolutions lead to destruction?
- Why would two countries choose to go to war with each other to resolve a conflict?
- Are there any times when going to war is constructive to both sides? If so, what situations?

C. Give each student copies of the world map (2b) and the sheet listing countries currently at war (2c). Ask students to color in all countries that were at war in 1982-1983. Discuss:

- From reading the newspapers, do you know why any of these countries are at war?
- Are there one or two conflicts that are more dominant than others? If so, what are they? Why would countries go to war over such conflicts?
- Are there any conflicts in which use of nuclear weapons would be justified? If so, which ones?

Save the completed maps for use in Day Seven.

D. Play the Dollar Game. Use Teacher Resource Sheet 2d to direct the game. After completion of the game, discuss:

- What were your immediate reactions to bidding?
- At what point did you realize that bidding higher and higher doesn't work in your favor?
- Do you think people will automatically compete when any situation such as this comes up? Why or why not?
- Do you think countries respond to conflicts in this way? Why or why not?
- How did negotiations help both sides? Do you think this would be the same between countries? Why or why not?

E. Homework: Tell students to write about a time when they helped to resolve a conflict constructively between two people. They should include reasons that they thought the resolution reached was constructive.

Notes:

INDIVIDUAL CONFLICTS

A conflict is a controversy, disagreement, or opposition between two sides. Resolutions are courses of action decided upon. Think of three typical conflicts that occur between individuals and write them below in the first column. In the second column, for each conflict you wrote down, write three possible resolutions for that conflict.

CONFLICT	RESOLUTION
1	1 a
	1 b
	1 c
2	2 a
	2 b
	2 c
3	3 a
	3 b
	3 c

20

2b

Artic Ocean
GREENLAND
ICELAND
NORW.
SWEDEN
CANADA
UNITED KINGDOM OF GREAT BRITIAN & NORTHERN IRELAND
DENMARK
IRELAND
NETHERLANDS
BELGIUM
LUXEMBOURG
SWITZERLAND
FRANCE
EUROPE
NORTH AMERICA
UNITED STATES OF AMERICA
PORTUGAL
SPAIN
ANDORR
Atlantic Ocean
TUNISIA
MOROCCO
ALGERIA
MEXICO
BAHAMAS
CUBA
HAITI
DOMINICAN REPUBLIC
JAMAICA
BELIZE
PUERTO RICO
DOMINICA
ST LOCIA
BARBADOS
GUATEMALA
HONDURAS
NICARAGUA
EL SALVADOR
GRENADA
ST VINCENT & THE GRENADINES
TRINIDAD & TOBAGO
COSTA RICA
PANAMA
VENEZUELA
SURINAM
COLOMBIA
FRENCH GUIANA
GUYANA
SENEGAL
CAPE VERDE
GAMBIA
GUINEA BISSAU
GUINEA
SIERRA LEONE
LIBERIA
MAURI-TANIA
MALI
UPPER VOLTA
IVORY COAST
TOGO
GHANA
SAO TOME & PRINCIPE
EQUATORIAL GUINEA
CAMEROON
Pacific Ocean
EQUADOR
PERU
BRAZIL
BOLIVIA
PARAGUAY
CHILE
ARGENTINA
URUGUAY
SOUTH AMERICA
AFRICA
FALKLAND ISLANDS

FINLAND
UNION OF SOVIET SOCIALIST REPUBLICS
ASIA
LIECHTENSTEIN
POLAND
AUSTRIA
CZECHOSLOVAKIA
HUNGARY
ROMANIA
ALBANIA
YUGOSLAVIA
BULGARIA
TURKEY
GREECE
MALTA
CYPRUS
LEBANON
SYRIA
ISRAEL
IRAQ
IRAN
AFGHANISTAN
MONGOLIA
CHINA
NORTH KOREA
SOUTH KOREA
JAPAN
BAHRAIN
QATAR
PAKISTAN
NEPAL
BHUTAN
JORDAN
KUWAIT
SAUDI ARABIA
UNITED ARAB EMIRATES
INDIA
LIBYA
EGYPT
LAOS
TAIWAN
BURMA
HONG KONG
OMAN
YEMEN
SOUTH YEMEN
CHAD
SUDAN
VIETNAM
PHILIPPINES
BANGLADESH
THAILAND
DJIBOUTI
CAMBODIA
MALAYSIA
CEN. AF. REPUB.
ETHIOPIA
SOMALIA
SRILANKA
MALDIVES
UGANDA
RWANDA
BURUNDI
KENYA
PAPUA NEW GUINEA
TANZANIA
ZAIRE
SEYCHELLES
ANGOLA
MALAWI
COMOROS
INDONESIA
ZAMBIA
ZIM BABWE
Indian Ocean
NAMI BIA
BOTS-WANA
MAURITIUS
AUSTRALIA
MADAGASCAR
MOZAMBIQUE
SWAZILAND
SOUTH AFRICA
LESOTHO
Pacific Ocean
NEW ZEALAND

Countries at War and Why

1. **Israel and Lebanon and Syria**
   Homeland (Israeli and Palestinian)
   Persian Gulf oil
   Soviet Union access to Gulf and Mediterranean Sea; world sea lanes
2. **Iran and Iraq**
   Resources
   Dominance of Persian Gulf Oil
3. **El Salvador**
   Civil war involving support from outside countries (United States)
   Poor people fighting for land and better pay against rich landowners
4. **Guatemala**
   Same as above
5. **Argentina and England**
   Militarily strategic island
   Oil
6. **Eritrea and Ethiopia and Somalia and Cuba**
   Access to water
   Eritrea wants independence from Ethiopia
   Somalia and Ethiopia fighting for border region (Ogaden)
   Cuba and Soviet Union aid Ethiopia with arms
   United States supplies Somalia with arms
7. **South Africa and Namibia and Angola**
   Black Namibians want independence from white-ruled South Africa
8. **Cambodia and Viet Nam**
   Civil war in Cambodia, resulting from outside influence
   Viet Nam invades Cambodia
   Soviet Union supplies Viet Nam; China supplies Cambodia
   Superpowers fighting for power
9. **Soviet Union and Afghanistan**
   Civil war in Afghanistan
   Soviet Union invades with large army and supports government in power near Persian Gulf oil
10. **Angola**
    Civil war in Angola with government aiding Namibia
    South Africa government aiding Angola rebels
    Natural resources of Namibia (minerals, water power)
    Natural resources of Angola (minerals, water power, agriculture, oil, and coffee)
11. **Libya and Morocco and Sahara**
    Civil war in Sahara over phosphate fertilizer
    Algeria and Libya vs. Morocco—all want to take over Sahara

12. **South Yemen and North Yemen**
    Civil war
    South Yemen aiding rebels
    Racial, ethnic differences
13. **Philippines**
    Civil war with poor Moslem minority fighting government
    United States supplies government with arms and money
    United States gets its biggest military base in Pacific Ocean in return
14. **Indonesia vs. East Timor (West Timor)**
    East Timor fighting for independence
    United States supports Indonesian government in return for favorable oil investments and political support in Asia
15. **Chad**
    Civil war involving Libyan and French money and troops
    Former French colony—French financial interests dominate the country (agriculture)
16. **Northern Ireland**
    Religion
    Economic opportunity

THE DOLLAR GAME

This demonstrates that bargaining compromise, and negotiation can help everyone. Two teams compete for the same goal—a $1 bill—and their efforts to outbid each other do not result in a gain.

Rules: Get two volunteer groups of four students on a side. Hold up a dollar and tell them you will give it to the side that makes the highest bid. *Both sides* must give money they bid to you, regardless of whether they get the dollar. Flip a coin to see which side goes first.

After one side bids a few cents, the other side will bid higher. Both sides may bid as high as they want to go, until they reach 99¢. At some point, they will see their folly! After one side goes over 50¢, it may become apparent that *you* will gain at the next bid, since the sum of the two bids will be more than $1. One side may even begin to negotiate with the other at an earlier point.

After playing one time, discuss the strategies that the group used. Suggest that there are ways that both groups could gain. If they didn't negotiate the first time, play again.

Both sides can gain if they negotiate early so that each side bids less than 50¢. They split the dollar, and you lose.

DAY THREE:

Weapons and the Nuclear Bomb

Objectives

To discuss how the developing technology of weapons has changed their use and affects our attitudes toward them
To explain the basic physics of a nuclear bomb
To map out the potential effects of a nuclear explosion
To share reactions of the day

Materials

Photocopies of student worksheets
Cup and water
Large regional map
Photocopies of regional map
Compasses

Activities

A. Ask for two or three volunteers to read what they wrote for homework. Discuss.

- What methods of resolution to conflicts did students choose?
- What made those resolutions constructive?

B. Tell students that they are going to examine how weapons have changed over history. Give each student a copy of the "Development of Weapons throughout History" worksheet (3a) and the "Weapons Information" worksheet (3b). Ask students to fill in the chart by using the information sheet. Students can record their answers on the chart by writing the correct letter or number from the corresponding category on the information sheet. Allow ten to fifteen minutes for completion. Review the completed charts with the class, using the following answers: Fist (J, 1, e), Rock (D, 2, 3, h), Knife (A, 1, 2, c), Spear (C, 2, g), Bow and Arrow (G, A, j), Gun (E, 5, d), Cannon (F, 5, a), Hand grenade (B, 2, 3, f), Chemical Weapon (I, 5, b), Nuclear Weapon (H, 6, i).

Discuss the following:

- What changes happened throughout history in the methods of propelling weapons?
- How did weapons change in terms of the distance they traveled?
- How did weapons change in terms of their effects?
- How have these changes affected us and the world?

C. Give each student a copy of the "What is a Nuclear Bomb?" worksheet (3c). Read through the sheet together. Have students answer the questions at the end of the worksheet on another sheet of paper and hand them in. Review the questions and answers.

D. Write on the board CHANGE—QUANTITATIVE OR QUALITATIVE? Ask students if anyone can define the difference between these two kinds of change. If they cannot, explain to them that when something changes quantitatively, it means the number or amount of it changes. A qualitative change means something's actual nature changes rather than just its size. As an example, take a cup of water and fill it halfway. Start adding drops to the cup. This is a **quantitative** change. Then, heat or cool the water. That is a **qualitative** change. Another example is the difference between someone who has one glass of beer a night and increases it to two or three glasses a night, as op-

posed to that person becoming an alcoholic. Discuss the following:

- Is there a quantitative change between non-nuclear and nuclear bombs?
- Is there a qualitative change between these two bombs?
- Do you think there is a quantitative or qualitative change between the Hiroshima bomb and today's MX missile?
- Do you think the stakes in world conflicts have changed since the dropping of the Hiroshima bomb and the development of today's nuclear weapons?

E. Tell students that they are going to look at the effects of a nuclear explosion on their particular geographic area. You will need to find a map of your area encompassing 10 to 50 square miles and photocopies for the students. The Boston map in this section (3d) can be used if you cannot find a map of your area. Pass out the fact sheet describing the effects of a nuclear explosion within various geographical circumferences (3e). Students will need compasses to map out the effects within different circumferences of a nuclear explosion. If you don't have compasses, they can most likely be borrowed from a math teacher.

Review what students came up with. If you have a large map of your region, it would be helpful to pin this up on the wall and transfer their results to the map. Discuss:

- What would be the effects to our region if a nuclear bomb was dropped?
- How does this make you feel?
- What would happen in your own neighborhood?

F. Tell students that the exercises they have been doing produce a great many reactions. Tell them that you are going to say a phrase and you want each person to complete the sentence with whatever comes to mind. The phrase is, "Today's activities made me feel. . . " Say the phrase and quickly go around the room.

G. Homework: Pass out the "Nukes and More Nukes" worksheets (3f). Tell students to complete the worksheets for homework.

Notes:

FROM ROCKS TO NUKES:

The Development of Weapons Throughout History

Weapons have been used throughout the history of humankind as a means of resolving conflicts. The advances in technology since the first weapon was used have changed the nature of weapons drastically.

Below is a chart listing various weapons and the approximate dates they were first used. The other categories have not been filled in. Using the knowledge in your group and the weapons information sheet, fill in the appropriate information for each blank column, using the corresponding number or letter from the information sheet.

Weapon	Approx. Date First Used	Description and Method of Propelling	Distance Traveled	Effects
Fist	B.C.			
Rock	B.C.			
Knife	B.C.			
Spear	B.C.			
Bow and Arrow	B.C.			
Gun	1300			
Cannon	1400			
Hand Grenade	Late 1800's			
Chemical Weapon	Early 1900's			
Nuclear Weapon	1940s			

WEAPONS INFORMATION SHEET

Use the information below to fill in the "Rocks to Nukes" chart. On the chart, place the letter or number(s) of the definition that best fits the description.

Description and Method of Propelling

A. A short, thin, steel blade, very sharp

B. A small, round device containing explosive TNT that, when a pin is pulled, is thrown at an enemy and explodes upon contact within a certain time

C. A long, skinny pointed piece of wood with a stone tip that, when thrown at the enemy, pierces it

D. Small, mineral-based objects of no definite shape found on the ground

E. Thick, hollow tubes that throw leaded objects to penetrate a target

F. Large, heavy tubes used to throw huge leaded balls great distances

G. A long, skinny pointed piece of wood with a stone tip, shot from a curved piece of wood with a string

H. A powerful, radioactive mass projected or dropped on a target, resulting in both immediate and long-term damage

I. Dangerous powders, liquids, or gases breathed in or eaten that cause disease

J. A tight knot of knuckles

Distance Travelled

1. Arm's length or less from target
2. 20 feet from target
3. 50 yards from target (half a football field)
4. 100 yards from target (a full football field)
5. One to 100 miles
6. Over 100 miles

Effects

a. Can cause possible cuts, punctures, shock, or blows to the body, resulting in bruising, bleeding, broken bones, internal injuries, loss of limbs, or death to anyone within a 100-yard radius.

b. Can cause diseases or toxic reactions that produce disabling diseases or death to anyone within a radius of up to 10 miles

c. Can cause cuts, bleeding, possible internal damage, or death to one person.

d. Can cause puncture wounds with bleeding, possible internal injury, broken bones, or death to one person.

e. Can cause bruising, local pain, or broken bone to one person.

f. Can cause possible cuts, punctures, shock, or blows to the body, resulting in bruising, bleeding, broken bones, internal injuries, loss of limbs, or death to anyone within a 20-yard radius.

g. Can cause cuts, bleeding, possible internal damage, or death to one person.

h. Can cause bruising, local pain, possible open wound, broken bone, or slight chance of death to one person.

i. Can cause death, injury, or disabling sickness by explosion, fire suffocation, wind force, or lethal radiation to anyone within a 100-mile radius.

j. Can cause cuts, bleeding, possible internal damage, or death to one person.

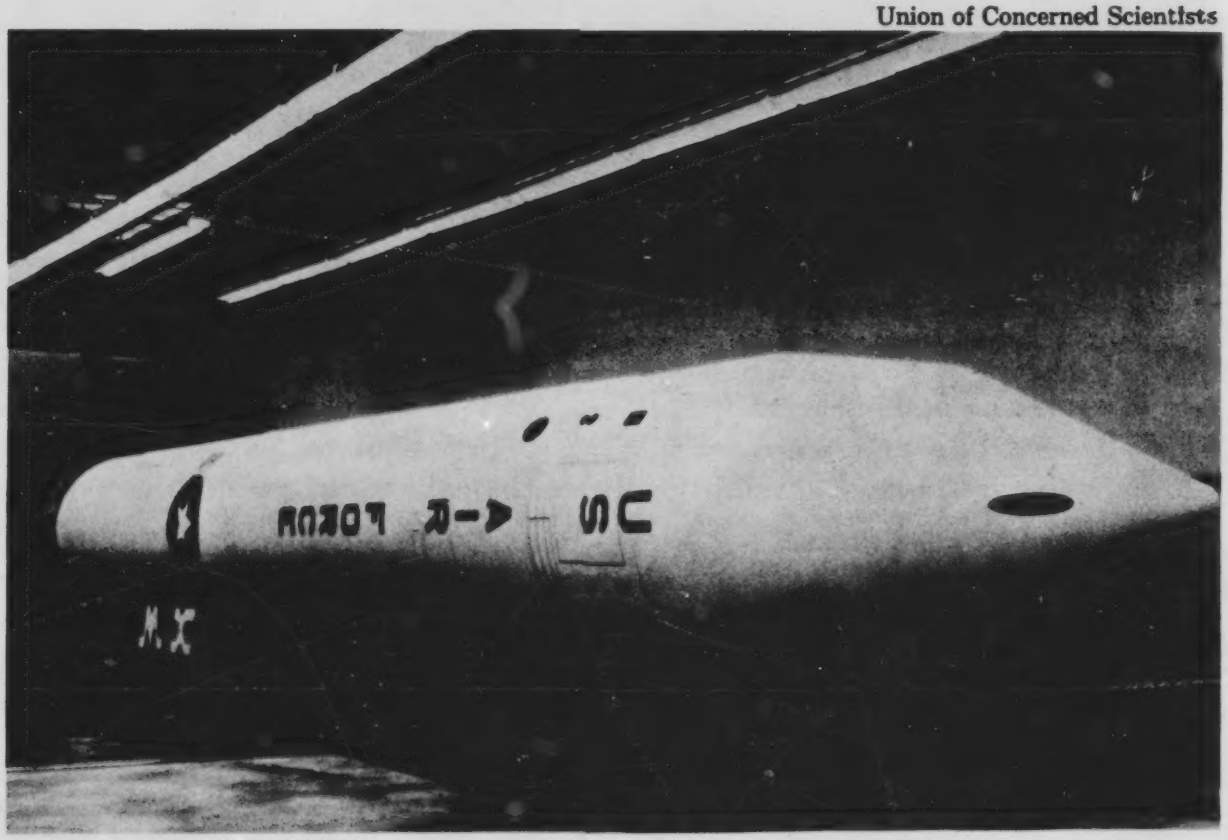
WHAT IS A NUCLEAR BOMB?

The atom bomb was created after the discovery of the fission process on radioactive elements, which releases enormous amounts of energy. After its development, scientists continued to research the potential power of the atom. A new theory called FUSION was developed: if you combine light-weight elements, as opposed to splitting heavy elements such as uranium, you can release an even greater amount of energy than that released by fission. The idea was not new; it is the same process that happens in the sun and others stars all the time. Four hydrogen nuclei fuse together to form a helium nucleus. In this reaction, combining atoms weigh more than the resulting one; the "lost mass" has really been converted to energy.

The fusion process requires tremendous heat. So, in constructing a nuclear weapon, scientists insert small fission weapons that generate the enormous heat required to get the fusion reaction going.

Today, one warhead in the new MX missile is about 25 times stronger than the Hiroshima bomb. Each MX missile alone carries ten warheads. That makes this nuclear bomb 250 times stronger than the Hiroshima bomb.

Union of Concerned Scientists



A model of the MX being developed by the US Air Force, one of the latest nuclear warhead-carrying missiles.

Effects of Nuclear Explosion

When a nuclear bomb explodes, the effects are both immediate and delayed. Right after the blast, intense heat is created. Temperatures ranging from millions to thousands of degrees cause everything within a few miles of the explosion to catch fire. A fireball is created that continues to spread and send out hurricane-like winds that destroy buildings and people.

Besides the blast, fireball, and winds, radiation is spread throughout the area. Radioactive materials produce radiation in the form of particles. *Alpha* particles are emitted at a low velocity (speed) and do not penetrate the body, although if they are ingested they will damage cells. These are the radioactive particles that are detected with a Geiger counter. *Beta* particles have a greater velocity and therefore a greater penetrating power. They do more harm inside the body. *Gamma* rays are of the shortest wavelength, but they have the velocity of light (186,000 miles per second) and cause a lot of damage, especially if they strike the genes in the cell's nucleus. Particles that emit gamma rays do not have to enter the body because the x-rays are so penetrating. The amount of damage done by radiation is determined by the strength of the explosion, the amount of exposure (the time you're in it), and your proximity to ground zero (where the bomb goes off).

Along with dust and earth, radioactive particles get sucked into the mushroom cloud that forms during the explosion. These are carried by wind and later fall back to earth as *fallout.* People and animals can be poisoned by radioactive fallout by absorbing it through the skin, breathing it, or ingesting (eating) it. Radiation sickness often leads to death weeks, months, and even years after a bomb explosion, since radiation is carried by the wind, earth, water, and plants.

Questions:

1. What is the fusion theory?
2. What starts the fusion process in a nuclear bomb?
3. How much stronger is the MX missile than the atom bomb dropped on Hiroshima?
4. List the events that result from a nuclear explosion?
5. Name the three forms of radiation that are emitted from a nuclear explosion and their effects.
6. If a one-megaton bomb can spread lethal radiation over an area of 100 square miles, how many megatons would wipe out the U.S. (with an area of 5,000,000 square miles)?

New Hampshire
NASHUA
HAVERHILL
METHUEN
LAWRENCE
LOWELL
GLOUCESTER
FITCHBURG
LEOMINSTER
DANVERS
BEVERLY
SALEM
BURLINGTON
PEABODY
WAKEFIELD
WOBURN
MELROSE
SAUGUS
LYNN
MALDEN
REVERE
MEDFORD
EVERETT
LEXINGTON
ARLINGTON
WALTHAM
SOMERVILLE
CAMBRIDGE
BELMONT
WATERTOWN
CHELSEA
BOSTON
Massachusetts Bay
MARLBORO
NEWTON
BROOKLINE
WELLESLEY
NATICK
FRAMINGHAM
NEEDHAM
DEDHAM
MILTON
QUINCY
BRAINTREE
WEYMOUTH
WORCESTER
NORWOOD
RANDOLPH
Atlantic Ocean
BROCKTON
PLYMOUTH
Connecticut
Rhode Island
WOONSOCKET
ATTLEBORO
TAUNTON
Cape Cod Bay
PAWTUCKET
PROVIDENCE
CRANSTON
FALL RIVER
WARWICK
NEW BEDFORD
SCALE: 0 5 10 MILES
1
3
95
128
2
495
122
90
52
24
140
44
6

THE EFFECTS OF A ONE-MEGATON BOMB

Most of the nuclear bombs that the Soviet Union and United States have are from one-megaton to 20-megaton capacity. A one-megaton bomb is approximately 100 times the force of the atom bombs dropped on Hiroshima and Nagasaki by the United States during World War II. And many of each country's nuclear missiles contain multiple warheads, meaning that one missile contains 2 to 25 one-megaton bombs.

What do you think would happen if just one one-megaton bomb dropped on your city or town? (Actually, in a limited nuclear attack, a multiple warhead missile would be used.) Use the figures below (and a compass) to chart on your maps the effects of a one-megaton bomb to the region surrounding your city or town. Draw each circumference area and label it.

0-2 miles	Total destruction Winds 400 miles per hour 99% dead A crater ¼ mile in diameter and 20 stories deep
2-3 miles	50% dead from the explosion 25% dead later from injuries and burns 20% injured or victims of 2nd- and 3rd-degree burns Most buildings flattened Winds 180 miles per hour
3-5 miles	50% killed or injured Winds 150 miles per hour Most buildings flattened
5-10 miles	25% dead from injuries or burns Winds 100 miles per hour Most buildings damaged Anyone in the open would receive at least 2nd-degree burns
1-10 miles	If started, firestorms could kill thousands more either directly or by consuming all oxygen so people suffocate Lethal radiation is spread throughout the area (lethal radiation is defined as radiation levels capable of killing half of all young, able-bodied adults, those best able to withstand doses of radiation)
10-100 miles	Under average weather conditions, this entire area would be lethally contaminated

Statistics compiled from the Office of Technology Assessment

NUKES AND MORE NUKES

Or Counting the Dots

How many nuclear weapons does the world actually possess today? To realize the enormous amount of weapons that exist, look at the dot-filled page in front of you. Mark a dot in the center square. This dot represents all the firepower of World War II, a total of three megatons of TNT.

Look at all the other dots on the page. There are 120 other squares with 50 dots in each square. How many dots is this?_____ These other dots represent the number of World War II equivalents that now exist in nuclear weapons: 18,000 megatons. About half belong to the Soviet Union and the other half to the United States, with miniscule amounts belonging to Great Britain, France, China, and India.

Draw a circle around three dots. This represents the weapons on just one Poseidon submarine. How many megatons is this?_____ How many World War II equivalents is this?_____ This is enough firepower to destroy over 200 of the Soviet Union's largest cities. We have 31 such subs and 10 similar Polaris subs.

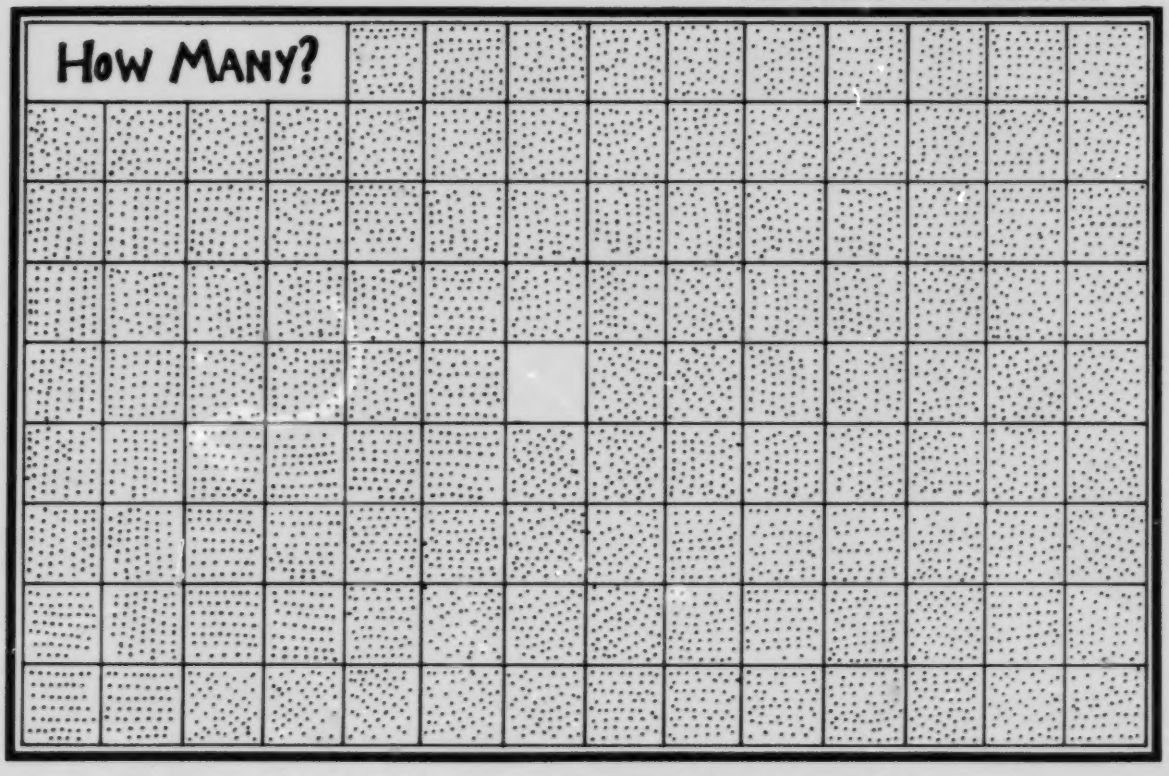
Draw a circle around eight dots. This represents the weapons on one new Trident submarine. How many megatons is this?_____ How many World War II equivalents is this?_____ This is enough firepower to destroy every major city in the northern hemisphere.

The Soviets have similar levels of destructive power.

Get a dime and place it on this chart. The dots you covered with the dime represent enough firepower to destroy all the large and medium-size cities in the entire world.

Questions:
- Why do these weapons exist?
- How does this make you feel?

Adapted from chart by James Geier & Sharyl Green in *Nuclear War in Vermont*, 1982.



DAY FOUR

The Biological Effects of a Nuclear Explosion

Objectives

To understand the physiological effects of a nuclear explosion
To learn about the positive contributions survivors of the Hiroshima bomb make to the world today

Materials

Photocopies of student worksheets
Newsprint, magic markers, and tape
Chart of the human body, including different systems (optional)

Activities

A. Have students hand in their homework and ask for reactions to it.

- Does seeing the comparison in dots give you a greater sense of the difference between weapons of today and weapons of World War II? If so, how?

B. Split students into groups of four. Pass out to each student a copy of the fact sheet describing the physiological effects of a nuclear explosion (4a). Also distribute to each group a sheet of newsprint and a magic marker. Tell students that this activity is going to be a race. The object of the race is to be the first group to categorize correctly all the effects of radiation on the human body and tape their finished chart on the wall.

Each group should choose a recorder, who will make two columns on the newsprint and write the following headlines at the top: SYSTEM, DAMAGE CAUSED BY RADIATION. In the first column, the recorder should write the numbers one through ten and write the following words beside the numbers: SKIN, SKELETAL, MUSCULAR, RESPIRATORY, CIRCULATORY, DIGESTIVE, REPRODUCTIVE, URINARY, NERVOUS, ENDOCRINE (OR HORMONAL). You may want to review the ten categories briefly to ensure that students know the meanings. Tell students that when you say GO, the task of each group is to read the sheet describing the physiological effects of a nuclear explosion and write in the proper category the damage caused by radiation to each system. Tell the groups that they should continue to work on their charts even if another's chart is taped on the wall, as it might not be correct.

When all groups have finished, use the Teacher Resource Sheet 4b to evaluate each chart. The winner is the group that finished first with its chart completed correctly. Review the information on the charts, using the human body chart to help explain the information. Discuss:

- The very young, as well as the very old, are very susceptible to radiation damage. Why do you think this is so?
- White blood cells are important to the body in fighting bacteria and foreign particles. Like red blood cells, they are made in the bone marrow. Why does radiation lower a person's resistance to infection?
- Is there anything else existing in the world that has such effects on the human body?
- How does it make you feel to have done this exercise?

C. Pass out the set of pictures (4c) and the quotations from Hiroshima victims (4d). Tell students that these are pictures depicting Hiroshima after the bomb was dropped and statements made by the survivors. Ask students to look at the set of pictures. Then ask

for volunteers to read the quotations aloud to the class.

Write the word REACTION on the board. Ask students to say the first thing that comes to mind from looking at the pictures and reading the statements. They can be feelings, thoughts, or images. Write everything that is said on the board. Discuss:

- Read through the list of reactions. Can anyone summarize in a couple of sentences the general reaction?
- What do you think it must have felt like to be a survivor of the bomb and not know what had happened to you?
- If you were a Hiroshima survivor, how do you think you would look back on the bombing and feel about the present nuclear arms buildup?

D. Pass out to each student a copy of the *hibakusha* (pronounced HE BAK' SHA) worksheet (4e). Remind students that we have focused on the potential and actual destruction of the atomic and nuclear bombs, but now they are going to read about the people who survived the dropping of the bombs on Hiroshima and Nagasaki who are now making valuable contributions to world peace. Read the excerpts aloud. Discuss:

- What reactions do you have to these excerpts?
- How are thse two *hibakusha* taking actions on their beliefs and contributing to the world?

E. Homework: Pass out the worksheet "Interacting with the Environment" (4f). Tell students to complete it.

Notes:

4a

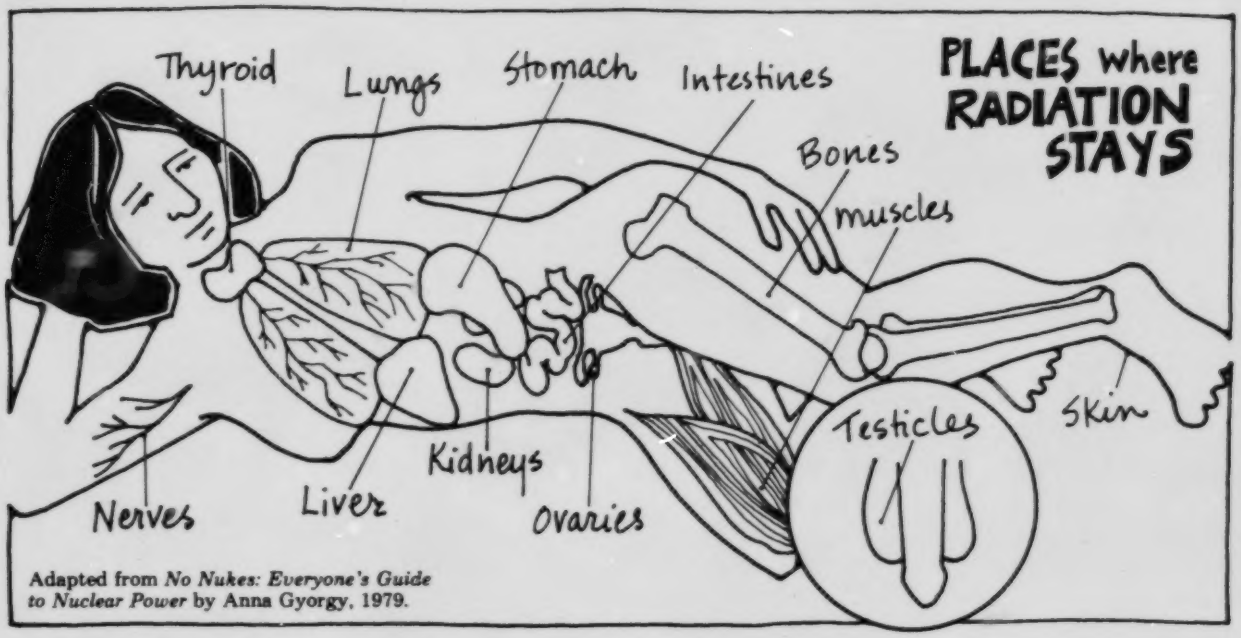
THE PHYSIOLOGICAL EFFECTS OF RADIATION

The descriptions below come from real events. Survivors of the 1945 Hiroshima and Nagasaki bombings have told their stories in words and pictures. Some years later, the U.S. tested nuclear weapons over the Marshall Islands in the South Pacific. Many natives of the islands and U.S. military personnel recounted what happened to them after the bombs dropped.

Persons exposed to large amounts of radiation suffer intense sweating, fever, damage to their stomachs, intestines, nerves, and muscles. They become dehydrated and apathetic. If a person inhales plutonium (a radioactive element in a nuclear bomb), the alveoli (or air sacs) of the lungs become permeable to blood and tissue fluids so the person has the sensation of drowning. Hypoxia (or loss of oxygen), heart failure, kidney damage, thyroid cancer, and leukemia may result later on.

Within even twenty miles from the blast, people will suffer third-degree burns in their eyes as well as over their bodies. If they inhale, ingest, or absorb through their skin radioactive particles, they will experience radiation sickness. Cells that normally divide often—such as those of the skin and the lining of the stomach and intestines—are damaged. Radiation penetrates the bone marrow, where blood cells are made. Symptoms of radiation sickness include: anorexia (loss of appetite), nausea, headaches, vomiting, diarrhea, anemia (too few red blood cells), loss of hair, skin sores, increased susceptibility to infections, and loss of reproductive capacity.

Remember, radioactivity cannot be seen, smelled, tasted, or felt and it stays in the air, food, and water for a long time as fallout.



Adapted from *No Nukes: Everyone's Guide to Nuclear Power* by Anna Gyorgy, 1979.

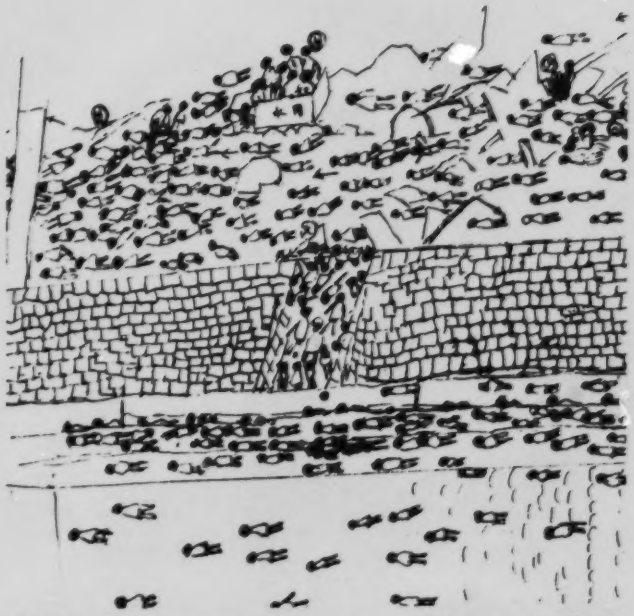
RADIATION AND THE HUMAN BODY

Use the "Physiological Effects of Radiation" worksheet to fill in the chart below, listing the damage done to each of the body's systems.

Systems of the Human Body	Damage Caused by Radiation	
Skin (or integumentary)	burns fever loss of cell reproduction	loss of hair sores sweating
Skeletal	destruction of blood cell formation in the marrow	increased incidence of infection
Muscular	muscle damage	
Respiratory	destruction of lung tissue	increased permeability, leading to flooding of the lungs
Circulatory	anemia heart failure	hypoxia (or loss of oxygen to to the body leukemia
Digestive	dehydration diarrhea loss of appetite	loss of cell reproduction vomiting
Reproductive	loss of female fertility and male potency	
Urinary	kidney damage	
Nervous	apathy blindness burns	cell damage headaches
Endocrine (or hormonal)	thyroid cancer	

Bodies lie in the ruins of Nagasaki, 500 meters from the hypocenter, August 10, 1945.

Boy carries his younger brother, Nagasaki.



Relief party recovers corpses at an elementary school, Hiroshima.

From *Hiroshima-Nagasaki: A Pictorial Record of Atomic Destruction*, by the Hiroshima-Nagasaki Publishing Committine, Tokyo, Japan, 1978.

VOICES OF HIROSHIMA VICTIMS

"How many seconds or minutes had passed I could not tell, but, regaining consciousness, I found myself lying on the ground covered with pieces of wood. When I stood up in a frantic effort to look around, there was darkness. Terribly frightened, I thought I was alone in a world of death, and groped for any light. My fear was so great I did not think anyone would truly understand. When I came to my senses, I found my clothes in shreds, and I was without my wooden sandals."

"A mother, driven half-mad while looking for her child, was calling his name. At last she found him. His head looked like a boiled octopus. His eyes were half-closed, and his mouth was white, swollen, and pursed."

"A woman who looked like an expectant mother was dead. At her side, a girl of about three years of age brought some water in an empty can she had found. She was trying to let her mother drink from it."

"While taking my severely wounded wife out to the riverbank by the side of the hill of Nakahiro-machi, I was horrified, indeed, at the sight of a stark naked man standing in the rain with his eyeball in his palm. He looked to be in great pain, but there was nothing I could do for him."

"I just could not understand why our surroundings had changed so greatly in one instant. . . I thought it might have been something which had nothing to do with the war—the collapse of the earth, which it was said would take place at the end of the world, and which I had read about as a child."

"The street was cluttered with parts of houses that had slid into it, and with fallen telephone poles and wires. From every second or third house came the voices of people buried and abandoned, who invariably screamed, with formal politeness, 'Tasukete kure! Help, if you please!' The priests recognized several ruins from which these cries came as the homes of friends, but because of the fire it was too late to help."

"They held their arms bent (forward). . . and their skin—not only on their hands but on their faces and bodies, too—hung down. . . If there had been only one or two such people. . . perhaps I would not have had such a strong impression. But wherever I walked, I met these people. . . Many of them died along the road. I can still picture them in my mind—like walking ghosts. They didn't look like people of this world."

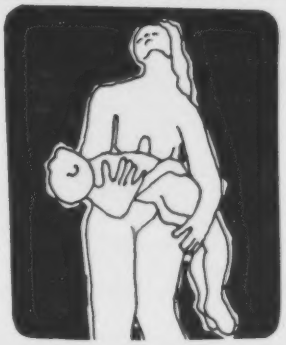
"My face was so distorted and changed that people couldn't tell who I was. After a while I could call others' names but they couldn't recognize me. Suddenly, I wondered what had happened to my mother and sister. My mother was then forty-five, and my sister five years old. When the darkness began to fade, I found that there was nothing around me. My house, the next door neighbor's house, and the next had all vanished. I was standing amid the ruins of my house. No one was around. It was quiet, very quiet—an eerie moment."

(From *Unforgettable Fire*, by the Japanese Broadcasting Corp.)

4e

HIBAKUSHA—A-BOMB SURVIVORS

The bombing of Hiroshima and Nagasaki caused a tragic loss of lives and is a very upsetting experience for us to look back on. But many survivors of Hiroshima and Nagasaki live on today and make important and positive contributions to the world. *Hibakusha* is the Japanese word for one who survived the dropping of the atomic bomb. Below are some excerpts from a recent book about *hibakusha.*



The heavy bone
would be that of the teacher,
beside it
lie
bones of little heads.

Hiroshima Peace Memorial Park statue for elementary school teachers and children who died in the bombing.

From *Hiroshima-Nagasaki: A Pictorial Record of Atomic Destruction.*

Busuke Shimoe (born 1903):

"Mr. Shimoe lives in a village named Kinoyama, surrounded by mountains. . . . His wife and daughter were killed in the bombing. The phrase 'burnt like tree leaves' has often been used to describe the human damage done by atomic bombs. I understood this when he took off his clothes and showed me his burnt skin. . . . I visited Mr. Shimoe (in) March. He had just returned from the journey throughout the country in the campaign to ensure no repetition of the A-bombs and to demand the enactment of a victim's relief law. He said he was accompanied by Masuhito Higaki, Representative of the Victim's Association, in his visits to small villages in the prefecture. The journey, he said, was part of the 35 million signature and funds collection campaign to support the United Nations Special Session on Disarmament."

Hatsuko Tominaga (born 1914):

"There is an eye affliction that causes specks in the eyes and blots out the eyesight. It is a form of atomic cataract. . . . A sharp pain runs through the body, interrupting her even when she is speaking. She endures it, silently. . . . On medical advice, she had her left breast removed because of a tumor. . . . On fair Sundays, she goes to church. She then goes to the Atomic Bomb Museum through the Atomic Bomb Dome. She does this to hand out pamphlets she wrote as an appeal to those who visit there from every part of Japan. . . . On her finger she wore a ring, engraved with the mark 'F-105-D.' In the last stages of the Vietnam War, the people were afraid the USA would use nuclear weapons. So she took the lead in street-campaigning to 'Ban the use of nuclear weapons.' After the war ended, a delegate from Vietnam who visited Hiroshima was wearing the ring on her finger."

As of March 31, 1977, there were "366,523 men and women registered survivors, counting only those who have the official health certificate issued to victims present on those days." Many of them, like the two above, continue to devote their lives to creating a better world.

". . . Condemning nuclear weapons, as a violation of humanitarian and international laws, we, as surviving A-bomb victims, wholeheartedly pledge our utmost efforts to eliminate these weapons from the earth as soon as possible, and to defend peace."

Part of a 1977 Prayer Ceremony for the Consolation of the Hibakusha, Nagasaki

Excerpted from *Hibakusha*, Morishita Ittetsu Photographic Office, Shibuya-ku, Tokyo, 1978

INTERACTING WITH THE ENVIRONMENT

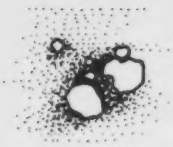
In looking at the effects of a nuclear explosion, we must consider the damage not only to human life but also to the earth. Our environment is our total surroundings, including biotic (living) and abiotic (nonliving) factors. We are in constant interaction with our natural systems, both directly and indirectly, and consequently, they always have an effect on us.

Below are listed five areas of our environment. For each category, list two ways that humans and that part of the environment interact.

Soil

a.

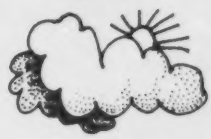
b.



Atmosphere

a.

b.



Water Cycle

a.

b.

Plant Life

a.

b.

Animal Life

a.

b.

1. Do the five factors of the environment also interact with each other? If so, give an example.

2. Why could this interaction make the spreading of radiation throughout the environment especially dangerous?

DAY FIVE:

The Ecological Effects of a Nuclear Explosion

Objectives

To understand the ecological effects of a nuclear explosion

Materials

Photocopies of student worksheets

Activities

A. Review homework. Write on the board the following: SOIL, ATMOSPHERE, WATER CYCLE, PLANT LIFE, ANIMAL LIFE, HUMAN LIFE. Go through all the terms except the last and ask students to state ways that humans interact with that part of the environment. Discuss:

- How are all parts of an environment interrelated?

Have students hand in their homework.

B. Ask students what the three components of the earth are (water, air, and land). Tell them they are going to do an exercise that demonstrates some of the ecological effects of a nuclear explosion. Divide the class into four groups. Tell them that each group is going to receive a different problem sheet that examines one of four ecological effects on the environment from a nuclear bomb explosion. The four problem areas will be effects on the water cycle and soil, food chains, the atmosphere, and health and diseases.

Pass out to each group the definitions sheet (5a) and one of the information sheets concerning ecological problems (5b). Tell students to spend five minutes individually reading the information sheets and reviewing the definitions. Ask if they have questions about the definitions. Then, pass out to each group the corresponding problem sheets (5c). Tell students that the task of each group is to use the information sheet to answer the problem sheet. Students should try to work together as a team and answer the problem sheets as thoroughly as possible because they will be teaching the rest of the class what they talked about and learned.

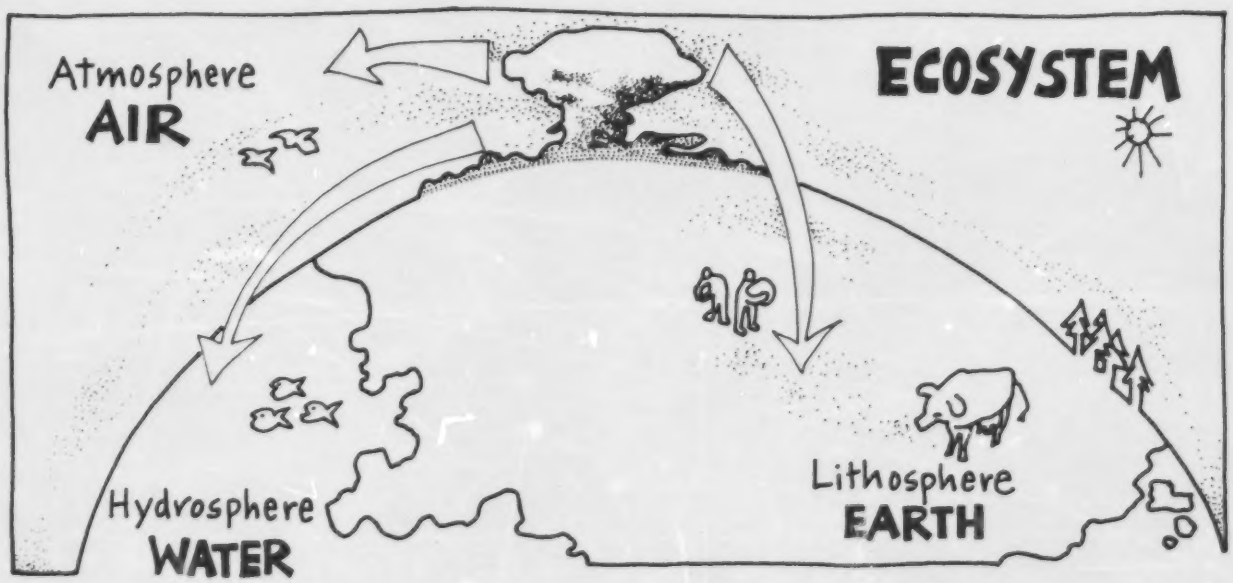
C. Allow each group fifteen to twenty minutes to discuss and complete the problem sheets. Then have each group pick one or two representatives, who will be experts in their particular field. They are going to represent their group on a panel on the ecological effects of a nuclear explosion. Arrange a long table in the front of the room. All panel members should seat themselves at this table, facing the rest of the class. You will be the moderator of the panel. Tell the students that they are going to listen to a panel of "experts" who will talk about the ecological effects of a nuclear explosion. Each person will speak for a few minutes, detailing the conclusions of their group about the effects of a nuclear explosion on their ecological area. After each panel member has spoken, allow questions from the class to the panel members. Once completed, end the panel discussion and summarize with the following questions:

- What is your reaction to the information you learned today?
- What do you think would be the capacity of our environment to sustain life after a nuclear explosion? If not immediately, how long would it be before life could be sustained in any way?

D. Homework: Pass out the "What's Your Nuclear IQ" worksheet (5d). Tell students to complete it.

DEFINITIONS: THE ECOLOGICAL EFFECTS OF A NUCLEAR EXPLOSION

Water Cycle	Water moving from ground and surface water into the atmosphere in the form of gas and returning to land and oceans in the form of rain, sleet, snow, or hail
Food Chain	The process of organisms consuming (or eating) each other—from producers (plants) to different levels of consumers (herbivores, omnivores, and carnivores)
Radiation	The emission of waves of particles (most can damage a human's body)
Contamination	Absorption of radiation (into an organism or material)
Troposphere	The layer of atmosphere closest to the earth's surface
Stratosphere	The layer of atmosphere directly above the troposphere
Ozone Layer	A layer of gases in the stratosphere that partially absorbs much of the sun's harmful ultraviolet rays
Fallout	The descent of minute particles of radioactive debris in the atmosphere following a nuclear explosion
Half-Life	The time required for half the nuclei in a radioactive particle to undergo decay, thus making it less harmful to the environment
Irradiation	Contaminated with radiation
Ecosystem	A physical environment and all the organisms within



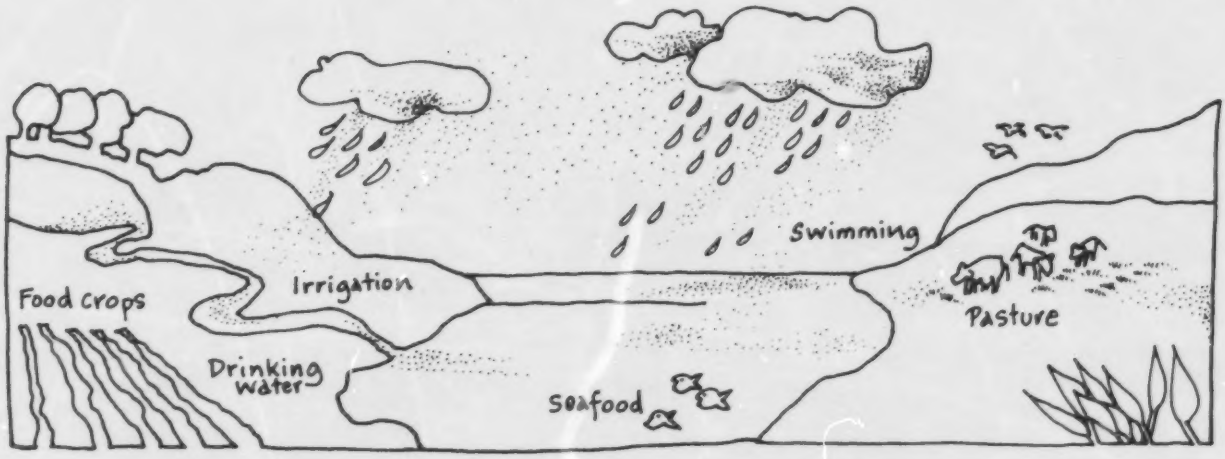
INFORMATION SHEET NO. 1:
THE EFFECTS OF RADIATION ON THE WATER CYCLE AND SOIL

Radioactivity can penetrate the environment in many ways. All types of radiation can be absorbed by both the soil and fresh and salt water. Any fallout that falls on land or water will remain radioactive until it reaches its half-life. Some radioactive particles have a half-life of hours or days, but others have half-lives of a year to a hundred or thousands of years. As long as the particles remain radioactive while in the soil or water, they can harm living organisms.

In soil, radioactive particles can be taken up into the roots of plants and thus contaminate the vegetation. They can also be ingested through the skin of any animal that walks the earth's surface, especially those that burrow into the earth and those that get their food from foraging on the ground.

In an area under heavy radiation, it is possible that all vegetation might be killed off. If this happened, much of the topsoil would begin to erode. The eroded soil would be blown and washed into nearby lakes, rivers, streams, and oceans, adding to the radiation that has already fallen directly into these water courses. At the same time, if the topsoil of the earth is eroded, it may lose the entire layer that provides most of the nutrients to plant life, thus making it impossible to grow anything for a number of years.

In water, two things can happen. Animal and plant life ingesting the irradiated water or living in a water environment can be harmed. Also, a large amount of fallout along with eroded topsoil can cause a condition called eutrophication. This is a process in which an oversupply of nutrients (or fallout) in water encourages growth of algae, bacteria, and other microscopic organisms. These, in turn, can use up the oxygen supply in the water.



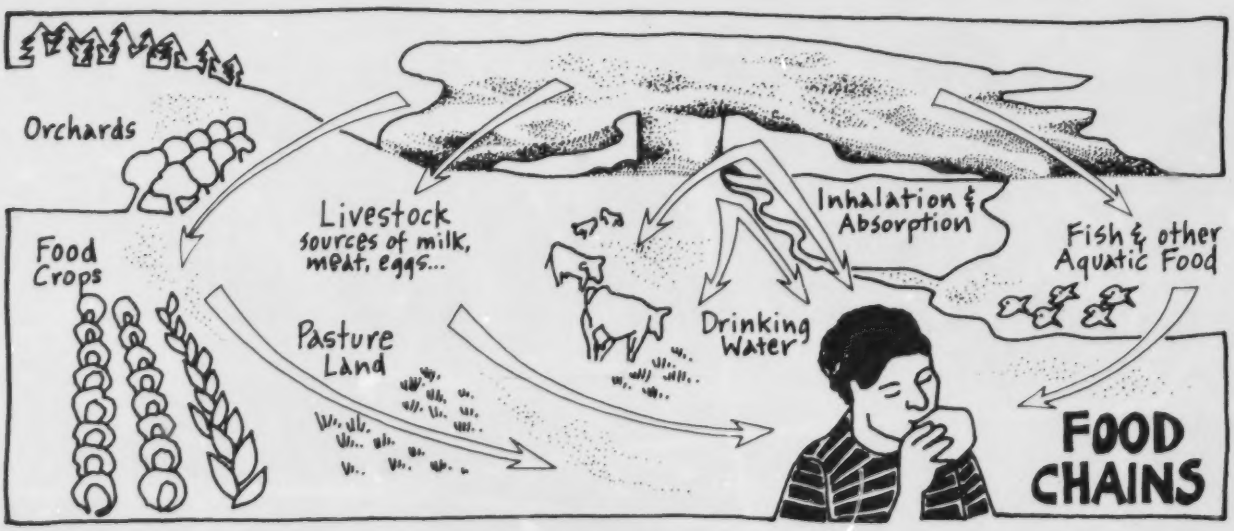
INFORMATION SHEET NO. 2:
THE EFFECTS OF RADIATION ON FOOD CHAINS

Radioactivity can be absorbed by living organisms in many ways. Gamma rays, which are emitted mainly within ten square miles of a nuclear explosion, can actually penetrate humans, animals, and plants, much like X-rays do. Alpha and beta particles do the most harm when they are ingested or inhaled by an organism. In addition, beta particles, which can fall within several hundred miles of an explosion, can harm an organism from without.

In areas where there are heavy doses of gamma rays and beta particles, much of the vegetation will be killed off. Other vegetation will either have radiation on its foliage, or absorb it through its roots.

Animals will suffer radiation from direct exposure, from eating irradiated vegetation, or from eating another animal that is contaminated. Certain kinds of radiation resemble common minerals in their chemical makeup, and so are easily absorbed into the body of an organism and stored. An example of this is strontium-90, with a half-life of 28 years. Strontium-90 resembles calcium in its composition, and therefore finds its way into the human diet through dairy products and is eventually deposited by the body in the bones.

For animal life that survives with relatively low doses of radiation, there arises a question of adaptability. Most organisms find the niche in the environment that is best suited for them. In irradiated areas, animals will be forced out of one place into another. With such a change in environment, it is unclear whether or not species of animals will be able to adapt, and whether or not new environments can sustain an added influx of organisms that need food. It is also unclear how an ecosystem, once upset and unbalanced, can renew itself.



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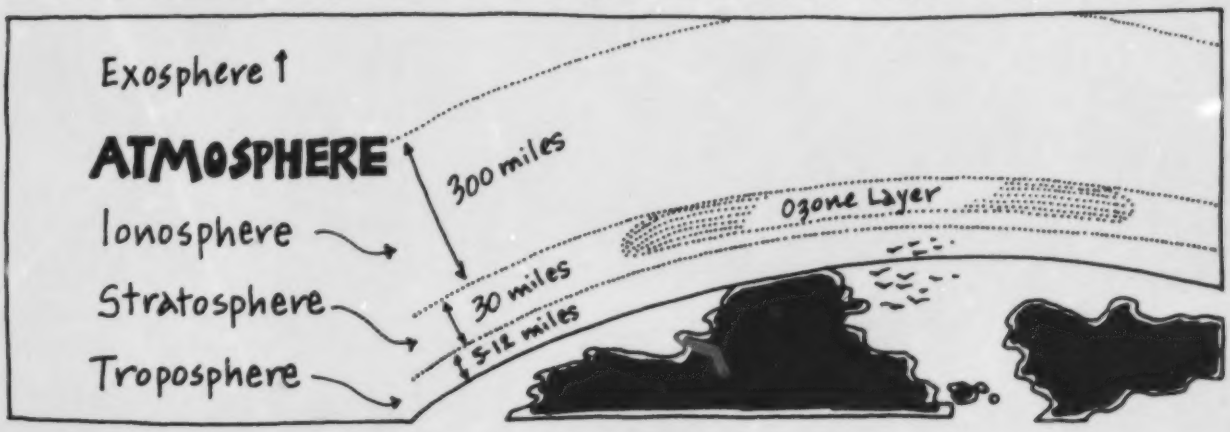
INFORMATION SHEET NO. 3:
THE EFFECTS OF RADIATION ON THE ATMOSPHERE

Fallout from a nuclear explosion not only falls to the ground in the vicinity of the explosion; it also rises high into the troposphere and stratosphere, and over a period of days, weeks, months, and even years, gets scattered over the surface of the earth. How much fallout is distributed depends on a number of factors. If the nuclear explosion is detonated a few hundred feet in the atmosphere, the fallout will settle in low concentrations over a considerable portion of the earth's surface. On the other hand, if the firefall from the explosion meets the earth (what is called a ground-burst), then most of the radioactive particles will mix with soil and drift to the ground in a cigar-shaped pattern within a few hundred miles of the explosion. The closer to the earth the explosion occurs, the higher the concentration of the radiation in the atmosphere. Winds and temperature are also factors that determine how widespread the fallout will be.

A ground-burst nuclear explosion could cause the lofting of millions of tons of dust into the stratosphere. It is unclear what the results of this event would be. Some scientists have claimed that this could cause more of the sun's energy and warmth to be reflected away from the earth's surface, causing a cooler surface and consequently climate. Other scientists say that the dust could trap heat escaping from the earth's surface, causing a warmer surface and climate. Both of these conditions could bring about drastic changes in the environment of many countries, thus affecting the types of vegetation, animal life, weather patterns, other natural resources, and human lifestyles.

Another possible result of a nuclear explosion to the atmosphere is the partial destruction of the ozone layer, a layer of gases in the stratosphere. This layer of gases filters out many of the sun's harmful untraviolet rays. A nuclear explosion, by burning nitrogen in the air, releases large amounts of nitrous-oxide gases. Scientists say that nitrous-oxide gases, through a series of chemical reactions, bring about a depletion of the ozone layer. Its duration and severity are not known, but could last for years.



INFORMATION SHEET NO. 4:
THE EFFECTS OF RADIATION ON HEALTH

After a nuclear explosion, there would be three classes of people: the dead, the wounded, and those relatively unaffected. Medical facilities within the area of the explosion would be unserviceable, destroyed by the explosion, fireball, or windblasts. Most doctors within a ten to one-hundred-mile radius would be dead, wounded, or sick from radiation exposure. Therefore, for all the people who were wounded, suffering from burns, or sick from radiation, there would be few doctors and even fewer medical facilities to treat them. For medical facilities that were still functioning, there would not be enough doctors and other medical personnel to serve all the patients requiring medical attention. Supplies in great demand, like blood plasma, would quickly run out.

Public health problems would also arise. Within the bomb blast area and its vicinity, sewers would not be working and, within a larger radius, many sewers would be backed up and overflowing. Lack of sanitation could cause a rapid spreading of bacteria and other germs, which could lead to an outbreak of diseases. As both water and food would be contaminated, this would add to sickness. Dead bodies would spread disease through rats and insects.

Radiation within the human body affects its immune system by attacking antibodies, which consequently reduces resistance to disease-causing bacteria. Therefore, with increased bacteria in the environment and a lowered resistance to diseases, epidemics would be possible.

Finally, the life forms that are most resistant to radioactivity are insects and microorganisms. These also happen to be the organisms that are traditionally carriers of disease-causing bacteria. Consequently, the greater radiation resistance of insects and microorganisms would add to the public health problem.

As many of the radioactive elements have half-lives of 30 years or more, it would be very difficult to restore a healthy ecological environment to the area of the blast. Water, soil, vegetation, and the atmosphere would remain contaminated for years to come.

PROBLEM #1: THE EFFECTS OF RADIATION ON THE WATER CYCLE AND SOIL

Use your knowledge of the water cycle to put in the appropriate arrows on your water cycle diagram to demonstrate the cycle of water between land, ocean, lakes, rivers, and the atmosphere. Work as a group to determine a diagram that best represents the water cycle.

Once completed, use your water cycle diagram to answer the following questions as a group. Pick a recorder to write down the answers you agree upon.

What would happen if a nuclear bomb dropped on a metropolitan area?

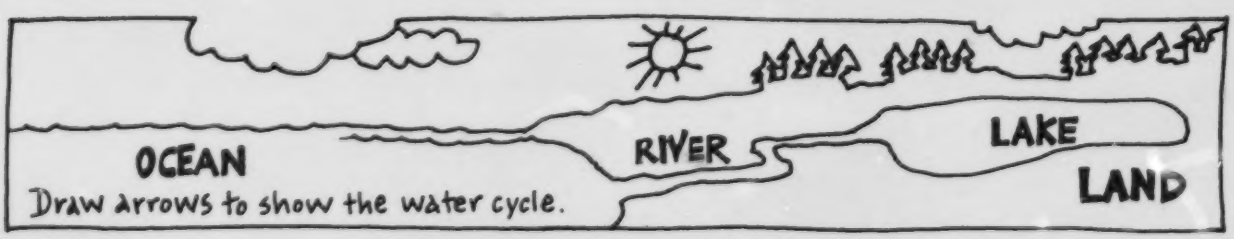
1. How could this result in contamination of your drinking water at a nearby reservoir? Name at least two ways.

2. How could this result in contamination of your fish supply off the nearest coast or in the nearest lake or river system? Name at least two ways.

3. How would contaminated soil affect plant growth?

4. How would this affect our food supply—produce, grains, meats, and dairy products?

5. Why would all parts of the water cycle be affected, no matter which part of the cycle was irradiated?



PROBLEM #2: RADIATION'S EFFECT ON FOOD CHAINS

The pathway from a plant (or producer, as it is called in biology) to a first-order consumer (a herbivorous animal) to second, third, and fourth-order consumers (carnivores) is called a food chain. Below, construct a land food chain and an ocean food chain, both ending with humans.

Land Food Chain:

_____ → _____ → _____

_____ → Human

Ocean Food Chain:

_____ → _____ → _____

_____ → Human

Look at the school of small fish in the picture. Note the black dots. Each dot stands for a small bit of harmful chemical, one-hundredth of a gram of strontium-90, emitted from a nuclear explosion, with a half-life of 28 years. Once consumed, the particles remain in the fish for the duration of its life.

- Fish A eats 10 small fish. How many bits of chemical will be in its body? Draw this number of dots in Fish A.
- Fish B eats 12 small fish. Draw dots to show the bits of strontium-90 in the body.
- Fish C eats 14 small fish. Draw dots to show the bits of strontium-90 in the body.
- Fish D eats A, B, and C. Draw dots to show the bits of strontium-90 in the body.

How does the amount of chemical in Fish D compare to the amount of chemical in one of the small fish?

What might a larger buildup of strontium-90 do to Fish D? How would it affect a human eating it?

This process of a consumer having to consume more of organisms in the level below it in order to sustain itself is called a food pyramid. Energy is passed from one level to the next with human beings at the top. At the bottom are millions of ocean and land plants and algae. Some of them are microscopic; others are big enough to see. The numbers of animals decreases as you go from producers to the different levels of consumers. If radioactivity was in the environment as a result of a nuclear explosion, how would this affect organisms in higher-order consumer levels?

PROBLEM #3: THE EFFECTS OF RADIATION ON THE ATMOSPHERE

Following are several problems that would occur in the atmosphere after a nuclear explosion. Use your information sheet to answer the following questions.

1. If a 20-megaton bomb was dropped on New York City and there was a wind coming from the southwest at 25 miles per hour, how long would it take for radioactive fallout to reach Boston 210 miles away?

2. The radiation level surrounding New York City after this nuclear bomb exploded would be "lethal," as officially defined—that is, within a radius of 23 miles, half of all young, able-bodied adults would die from radiation exposure. This means that for the very young, the elderly, pregnant women, or anyone not totally fit, the percentage of deaths would be greater than 50%. In Boston, because of radiation dispersal in the atmosphere, radiation levels would be "sublethal"—that is, they would cause radiation sickness without immediate death. What are some of the symptoms of radiation sickness that people in Boston might experience as a result of radioactive fallout traveling through the atmosphere?

3. What could happen if the ozone layer was depleted as a result of gases from a nuclear explosion?

4. What could happen to life and ecosystems if the earth's climate became cooler as a result of a nuclear explosion?

5. What could happen to life and ecosystems if the earth's climate became hotter as a result of a nuclear explosion?

PROBLEM #4: THE EFFECTS OF RADIATION ON HEALTH

What would be the effects of radiation from a nuclear explosion on public health? How would it affect the spread of diseases? Use the information you have to answer the following questions.

1. What are several things in our society that help protect us from disease that would not exist after a nuclear explosion?

2. What are several ways that disease could spread in a post-nuclear explosion environment?

3. What are several ways in which environments and people outside of a contaminated area could be affected?

4. Why would it be difficult to restore a healthy environment in a contaminated area?

5. Why would it be difficult to provide adequate medical services to an area that had just suffered a nuclear explosion?

WHAT'S YOUR NUCLEAR IQ?

Circle the letter or letters you think best answer the question or complete the sentence.

1. The temperature at the center of a nuclear explosion is: (a) the same as conventional weapons; (b) half of the sun's surface; (c) equal to that on the sun's surface; (d) many times hotter than on the surface of the sun

2. Which of the following are characteristics of radiation?: (a) invisible, odorless, and tasteless; (b) no taste, no smell, produces a faint burning sensation to the skin; (c) acid taste and smell; (d) a fine dust or haze, but no taste or smell

3. The animal most resistant to the cancerous effects of radiation is the: (a) mouse; (b) cockroach; (c) human being; (d) pig

4. The animal most vulnerable to the effects of radiation is the: (a) human being; (b) armadillo; (c) mouse; (d) cockroach

5. Which population is most likely to develop diseases and cancers following a nuclear attack?: (a) babies; (b) the elderly; (c) middle-aged men and women; (d) adolescents

6. Extensive escape and shelter plans have been devised for which of the following groups?: (a) president and his top advisors; (b) high-ranking military personnel; (c) top business executives; (d) school children

7. The Civil Defense "civilian relocation" plan operates on the assumption that before a nuclear attack Americans would have : (a) no advance warning; (b) less than 30 minutes warning; (c) a few hours warning; (d) several days' warning

8. About what percent of the United States budget will go to national defense in 1985?: (a) 20%; (b) 30%; (c) 40%; (d) 50%

9. Together, the Soviet Union and the United States have about how many strategic nuclear weapons?: (a) 8,000; (b) 12,000; (c) 14,000; (d) 16,000

10. Today's technology makes it possible to explode a nuclear weapon that, in a fraction of a second, releases more energy than: (a) World War I; (b) World War I and World War II; (c) all of the wars in the 20th century; (d) all of the wars in human history

Adapted from "Nuclear War in Vermont," a pamphlet prepared by Parents and Teachers for Social Responsibility

Answer the following:

- What information or ideas have been most important to you so far in this unit?
- Why was this information or idea important to you?
- How did this information make you feel?

DAY SIX:

Civil Defense and Limited Nuclear War

Objectives

To learn and evaluate the civil defense plan for the United States
To debate the possibilities of surviving a limited nuclear war

Materials

Photocopies of student worksheets
Copies of the "Nuclear Alert" worksheet (6c) cut apart into the three situations

Activities

A. Ask students to hand in their homework. Go through each question and ask students to state the answers: 1 (d), 2 (a), 3 (b), 4 (a), 5 (a), 6 (a,b), 7 (d), 8 (d), 9 (d), 10 (d).

B. Ask students what is needed in order to survive and list the answers on the board. Some of what they say may be luxuries (TV, cars, cigarettes, beer), and others will be necessities (food, water, shelter, clothing). Then ask them to agree on the five most critical items and circle them.

C. Split students into three equal groups. Give each student a copy of the "What is Our Civil Defense Plan" worksheet (6a) and read aloud to the class. Take copies of the "Nuclear Alert" worksheet (6b) and give the first group copies of the first situation, the second group copies of the second situation, and the third group copies of the third situation. Ask a student from each group to read their situation aloud, leaving out the questions. The task of each group is to answer the questions at the end of their nuclear alert situations. In doing this, they may need more information than they have. Therefore, at any time they may send a representative to any of the other groups to get information or ask questions. In fact, groups should seek to collaborate with each other. Each group should pick a recorder who will report back to the class. Allow fifteen to thirty minutes for the groups to discuss their situation and interact. Then have the recorder or another representative from each group report to the rest of the class on the nuclear alert situation they received and the conclusions they came to. After each group has reported, allow other students to ask the group questions. Discuss:

- Do you think the country's civil defense plan is realistic? Why or why not?
- If not, is there a realistic civil defense plan that would protect us from a nuclear attack? If not, why not? If so, what plan?
- How much warning do you think our government would expect to receive before a nuclear weapon exploded on our country?

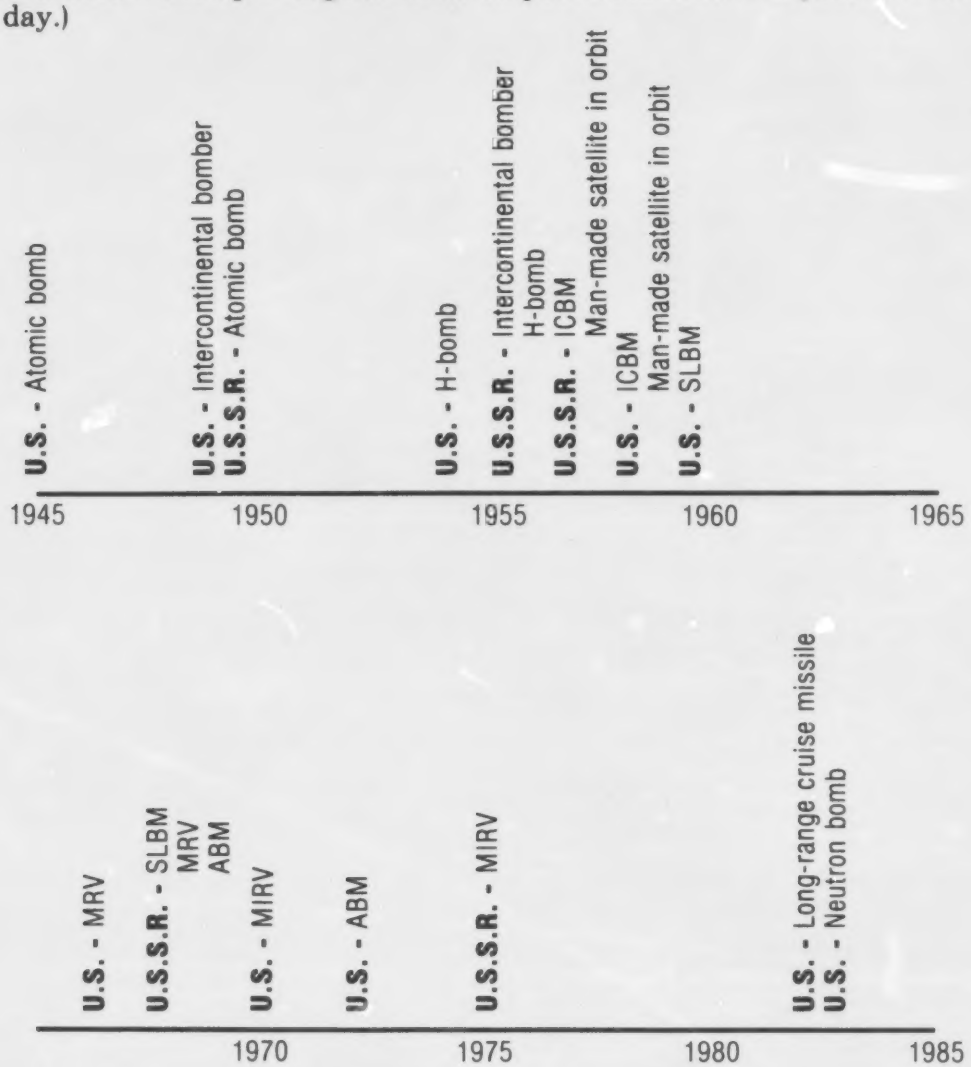
D. Pass out to students the worksheet containing pro and con arguments on the possibilities of surviving a limited nuclear war (6c). Tell students that many people believe there could be a limited nuclear war with only strategic targets bombed and that our society could recover from such a war. Ask two volunteers to read the two different sides on surviving a limited nuclear war. Take a tally to see how many students agree with each side. Tell students they are going to conduct a debate. If there are at least two or three students on both sides, split them up into groups according to how they voted. If there is only one student (or none) on one side, ask for volunteers to role play the other point of view. Tell each group it has five to ten minutes to prepare for a debate on the issue. Each group should develop concrete arguments for its own side,

using the worksheet as an aid. Once the groups have had time to prepare, arrange a table in front of the room. Have each group pick two or three representatives and seat them at the table. Tell the representatives that each group will have five minutes to present its side to the rest of the class. Then they can take ten minutes of questions and answers from the class or other panel members. Each group may make a one-minute closing speech. Conduct the debate. Discuss:

- Did anyone change his or her mind after listening to or participating in the debate? Why or why not?
- Why do you think government officials talk about the possibilities of such a war?
- What are the pros and cons of such a war?

E. Homework: Pass out the chart of significant dates in the arms race between the United States and the Soviet Union (6d) and the accompanying question sheet (6e). Tell students to make a timeline from the chart and answer the questions. Below is an example of how the timeline should look.

(Note: You should make up a large timeline on posterboard for everyone to discuss the next day.)



WHAT IS OUR CIVIL DEFENSE PLAN?

Top-level adminstrators and generals in the White House and Pentagon have conceded that there could be a nuclear war some day. Many of these government officials also believe that given a state of preparedness, our society could survive a limited nuclear war. Consequently, the Federal Emergency Management Agency (FEMA) has undertaken a seven-year, $4.2 billion project to create an effective civil defense plan for our country.

The three main aspects of the civil defense plan are (1) evacuation of urban populations, (2) building fallout shelters, and (3) training in survival tactics. Urban communities have been subdivided into sections, and each section has been assigned to a "buddy" community in a rural area three to eight hours driving time away. In the event of a limited nuclear war, cities may be targets. If a nuclear bomb exploded on a city, it could wipe out almost the entire population. But, if people had enough advance notice, as FEMA assumes, they could be evacuated to their "buddy" communities, where they would presumably be safe from the explosion and radiation.

FEMA is also encouraging the building of fallout shelters. In fact, it has already built extensive underground shelters for top government and Pentagon officials and their families. With advance notice, a fallout shelter could be constructed in anyone's home within a day. Eighteen inches of earth or a foot of concrete, if kept between oneself and the fallout, can diminish the radiation danger by a factor of ten. Thus, by piling earth around the outside of a home, one could create an additional barrier to radiation above the basement.

Finally, FEMA concedes that there would be great numbers of people seeking medical attention. The way to deal with this, they say, is to encourage everyone to participate in first aid emergency training. This would enable any healthy person to aid a sick or wounded person, thus relieving the dependence on medical personnel.

With these three measures effectively put into use, FEMA states that survivors of a limited nuclear war could reestablish a society with all its institutions functioning within a few years.

NUCLEAR ALERT!!

You live in a major industrial city. A nuclear bomb has already been exploded in another part of the United States. Since your city is an industrial center, it is a likely target if there is a nuclear war. The U.S. government has announced that the country should enact the civil defense plan. Your group is at work together when the alert is sounded. The civil defense plan for your city instructs you to go to a rural community 150 miles away. It is located upwind and in the mountains, so if a nuclear weapon did explode on your city, the possibility of lethal radiation reaching the community where you are going would be very slim. A total of 10,000 people from your city have been instructed to go to this rural community.

Answer the questions below. In doing so, you may need more information than you have. Therefore, at any time, you may send a representative to the other groups to get information or ask questions. Be prepared to present your conclusions to the rest of the class.

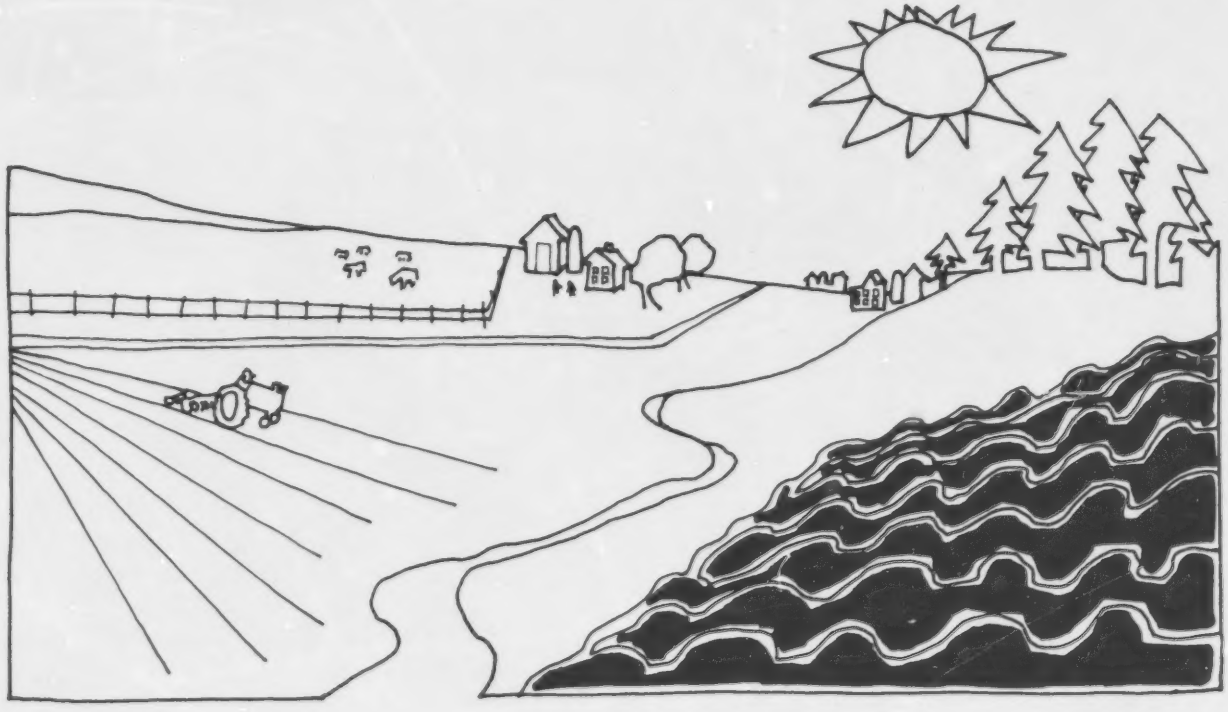
1. How will the people of your city reach their host rural communities?
2. What supplies, if any, would you need to take with you?
3. How much notice would an urban populace need to get out of the city? Consider the traffic and means of transportation that might become clogged.
4. How long can a rural community of 3,000 people host an added population of 10,000?
5. How realistic is your civil defense plan in the event of a nuclear attack?

NUCLEAR ALERT!!

You live in a rural community, 150 miles outside of a major industrial city. A nuclear bomb has exploded in another part of the country. The city you are near is a potential target for a nuclear weapon. Your community is probably safe from lethal radiation from a nuclear weapon exploded on that city because it is upwind and in the mountains. The U.S. government has announced that the country should enact the civil defense plan. For your community, the civil defense plan instructs you to receive 10,000 people from the city. Your community must house and feed these people for an undetermined length of time—until the last bomb drops elsewhere or, if a nuclear bomb does explode on the nearby city, until the level of radiation goes down to a habitable level, or the people are relocated.

Answer the questions below. In doing so, you may need more information than you have. Therefore, at any time, you may send a representative to the other groups to get information or ask questions. Be prepared to present your conclusions to the rest of the class.

1. Where would you house 10,000 people?
2. How would you feed 10,000 people, and how long would you be able to feed them?
3. How would this affect the functioning of your community?
4. If a bomb had dropped on the city, how would you deal with people who had been contaminated?
5. Is this plan realistic in the event of a nuclear war?



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NUCLEAR ALERT!!

You live in the suburbs of a major industrial city, ten miles from the downtown city center with a population of 20,000. A nuclear bomb has exploded in another part of the country. The city you are near is also a potential target for a nuclear weapon. If a nuclear weapon exploded on the city center, fireballs and powerful winds would reach the community in which you live. Lethal radiation would also be swept into your community. The. U.S. government has announced that the country should enact the civil defense plan. For your community, the civil defense plan instructs you to stay in fallout shelters. There are a number of fallout shelters that have been constructed by the town with enough room to fit 2,000 people and enough provisions to last a month. Pamphlets have been distributed to members of the community describing how to build a fallout shelter within their home, given a day's notice. Essentially, the method is to lay two feet of dirt or concrete around the foundation to protect the basement from lethal radiation. The family should then stay in the basement until lethal radiation levels have passed.

Answer the questions below. In doing so, you may need more information than you have. Therefore, at any time, you may send a representative to the other groups to get information or ask questions. Be prepared to present your conclusions to the rest of the class.

1. How would you protect yourself from fireballs and hurricane-force winds?
2. How much time would you need to build a fallout shelter for your house?
3. How would you ensure that everyone was in a fallout shelter (the elderly, people who live in apartment buildings, the disabled)?
4. How would you react when you saw people streaming out of the city, heading for an area far beyond you for protection?
5. If a bomb did drop on the city, how would you deal with complex injuries—burns, internal injuries, etc?
6. Is this a realistic plan in the event of nuclear war?

CAN WE SURVIVE A LIMITED NUCLEAR ATTACK?

The following are pro and con arguments for the possibility of surviving a limited nuclear war. Read each set of arguments and decide which one you agree with. Be prepared to state your reasons, as you are going to participate in a debate.

Pro Arguments for Surviving a Limited Nuclear War

1. With proper civil defense, it would take only two to four years for the U.S. to recover fully from an all-out nuclear war. We can take protective measures such as evacuation of urban populations, survival training, and the construction of simple fallout shelters.

2. People would have to help each other during this emergency by depending upon their goodwill and knowledge of first aid training. People pull together in times of emergency.

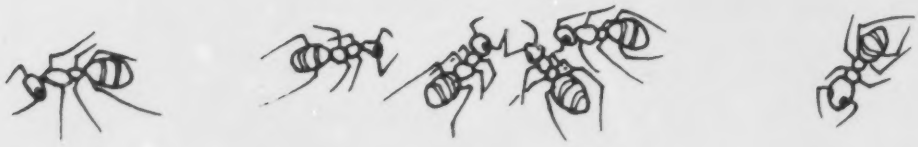
3. The possibility of disease and pestilence in the aftermath of nuclear war is probably just that—a possibility and not realistic. The major source of diseases have been eradicated and cannot return. Knowledge of sanitation and vaccines is widespread and survivors would be able to employ this to good advantage.

Con Arguments for Surviving a Limited Nuclear War

1. Any nuclear war would inevitably cause death, disease, and suffering of epidemic proportions. It would be impossible to get over the mental and emotional trauma to construct a new society. Most people would be contaminated, leading to mutated children in the future.

2. Effective medical intervention on any realistic scale would be impossible. Medical facilities and supplies are concentrated in the urban areas, so most doctors and facilities would be wiped out and the surviving population would not be treated.

3. Insects, many of which have an unexplained immunity to radiation, would thrive on the unburied corpses and infest surviving animals and, eventually, humans. Resurgences of diseases such as the plague, cholera, smallpox, and typhoid, could occur, not to mention a huge increase in influenza, pneumonia, meningitis, and hepatitis.



6d

THE ARMS RACE: ACTION AND REACTION

	U.S.	U.S.S.R.
First atomic bomb exploded	1945	1949
First atomic bomb used on people	1945	—
First intercontinental bomber developed	1948	1955
First H-Bomb exploded (1,000 times the force of bomb used on Hiroshima)	1954	1955
First intercontinental ballistic missile (ICBM) developed	1958	1957
First man-made satellite in orbit	1958	1957
First submarine-launched ballistic missile (SLBM) launched	1960	1968
First multiple warhead (MRV) developed	1966	1968
First anti-ballistic missile deployed	1972	1968
First multiple independently targeted warhead (MIRV) developed	1970	1975
First long-range cruise missile developed	1982	—
First neutron bomb developed	1983	—

Some Definitions

A-Bomb: a bomb with the force of 12,500 tons of TNT

Intercontinental Bomber: jet bomber designed for long-range travel

H-Bomb: a bomb with the force of 12,500,000 tons of TNT

ICBM: a land-based missile that carries nuclear warheads between continents with a range of 6,000 miles

SLBM: a nuclear-powered submarine that can fire long-range missiles from underwater

MRV: multiheaded missiles that could hit an increased number of targets

ABM: missiles designed to intercept and destroy attacking enemy missiles

MIRV: further development of MRV; can hit targets up to 100 miles apart

Cruise Missile: a small, highly accurate, low-trajectory missile that can fly under radar and can be launched from land, sea, or air

Neutron Bomb: bomb that releases tremendous amounts of radiation and relatively small amount of heat and blast

INTERPRETING THE TIMELINE OF THE ARMS RACE

Use the worksheet (6d) to construct a timeline showing the development of nuclear weapons in both the United States and the Soviet Union. Then use the timeline to answer the following questions.

1. What method of resolving conflicts have both countries chosen since 1945?

2. How has the United States contributed to the arms race?

3. How has the Soviet Union contributed to the arms race?

4. As technology has advanced over the years, what has been the goal of each country in developing new weapons?

5. What possibilities do these weapons create?

6. The United States has over 9,000 nuclear warheads aimed at the Soviet Union. The Soviet Union has over 7,000 nuclear warheads aimed at us. Has increasing the number of nuclear warheads made us more secure? Why or why not?

DAY SEVEN:

Nuclear Proliferation

Objectives

To discuss the proliferation of arms between the United States and the Soviet Union
To examine the question of nuclear superiority between the two countries
To discuss the worldwide trend toward developing nuclear weapons

Materials

Photocopies of student worksheets
Graph paper
Large world map
Colored pencils or magic markers

Activities

A. Review homework. Ask students to take out the timelines and question sheets they completed the night before for homework. Put up your larger timeline so everyone can see it. Go through the question sheet. Review and evaluate the timeline. Discuss:

- What is one way in which the United States and the Soviet Union have responded to each other over the past 25 to 30 years? Why do you think they have chosen to respond in this way?
- What effect do you think the arms buildup has had on each country?

B. Ask students if they can name the countries that have nuclear weapons today. Then tell them they are the United States, the Soviet Union, Great Britain, France, China, and India. Tell students that since the United States and the Soviet Union have by far the greatest number of nuclear weapons, they are going to chart the arms race between those two countries. Pass out the number chart on the arms race (7a) and graph paper to each student. Have students construct a graph using the figures on the chart, with both countries on the same graph. Discuss:

- What are some of the possible consequences of both countries having chosen to escalate the arms race?
- Why would both countries choose to do this?

Tell students to extend the graph beyond 1983 according to how they believe the arms race will continue. Discuss:

- What did you predict as the future of the arms race?
- What kind of world do those visions create?
- If you could have power over the development of the arms race, what would you decide to do in future years? Does this differ from what you think will happen?
- What would need to happen in order for the present course of escalation to change?

C. Write on the board U.S. FEARS and SOVIET FEARS. Ask students "Why is the United States so afraid of the Soviet Union?", and write the answers on the board. Do the same on the other half for SOVIET FEARS. Discuss:

- Compare the two lists. Are any answers the same? Why or why not?
- Are any answers different? Why or why not?
- How do our attitudes and fears affect U.S. foreign policy toward the Soviet Union?
- What might happen to our attitudes toward the Soviet Union if citizens in the U.S. knew more about the Soviet Union?

- What might happen to the attitudes of Soviet citizens if they knew more about the United States?

D. Write the word PROLIFERATION on the board. Ask students to define it. (*American Heritage Dictionary:* to increase or spread at a rapid rate). Pass out the worksheet detailing who has nuclear weapons (7b) and the world maps students completed in Day Two.

Have students use different colored pencils or different shadings to chart on a world map the countries within the four different categories. Tell them to make a key in one corner of the map explaining the colors or shadings. Discuss:

- Did you know that so many countries were close to having nuclear weapons?
- How does this knowledge make you feel?
- Why do you think countries feel the need to get nuclear weapons?
- How can this trend be changed?

E. Homework: Pass out to each student a copy of the "Priorities of Government Spending" worksheet (7c). Tell students to rank the statements according to the directions and then explain how they arrived at their No. 1 choice for the priority of government spending.

Notes:

HOW MANY DO YOU HAVE?

In 1945, the only country that had nuclear weapons was the United States. Since then, the Soviet Union, Great Britain, France, China, and India have developed nuclear weapons. But the Soviet Union and the United States are far and away the world leaders in numbers of nuclear weapons they possess.

Using the information below, plot on your graph the development of the growth of nuclear weapons for both the United States and the Soviet Union.

Year	Number of Nuclear Weapons for the United States	Number of Nuclear Weapons for the Soviet Union
1960	6,400	200
1962	6,000	500
1964	5,300	600
1966	4,800	900
1968	4,400	1,300
1970	4,000	2,000
1972	5,600	2,700
1974	7,600	2,900
1976	8,400	3,500
1978	9,000	4,400
1980	9,100	5,600
1982	9,500	7,000

WHERE THE BOMBS ARE

Group 1 Countries with nuclear weapons:

United States	Soviet Union
Great Britain	France
China	India

Group 2 Countries believed capable of building nuclear weapons:

Canada	Sweden
West Germany	Israel
Pakistan	South Africa
Switzerland	Japan

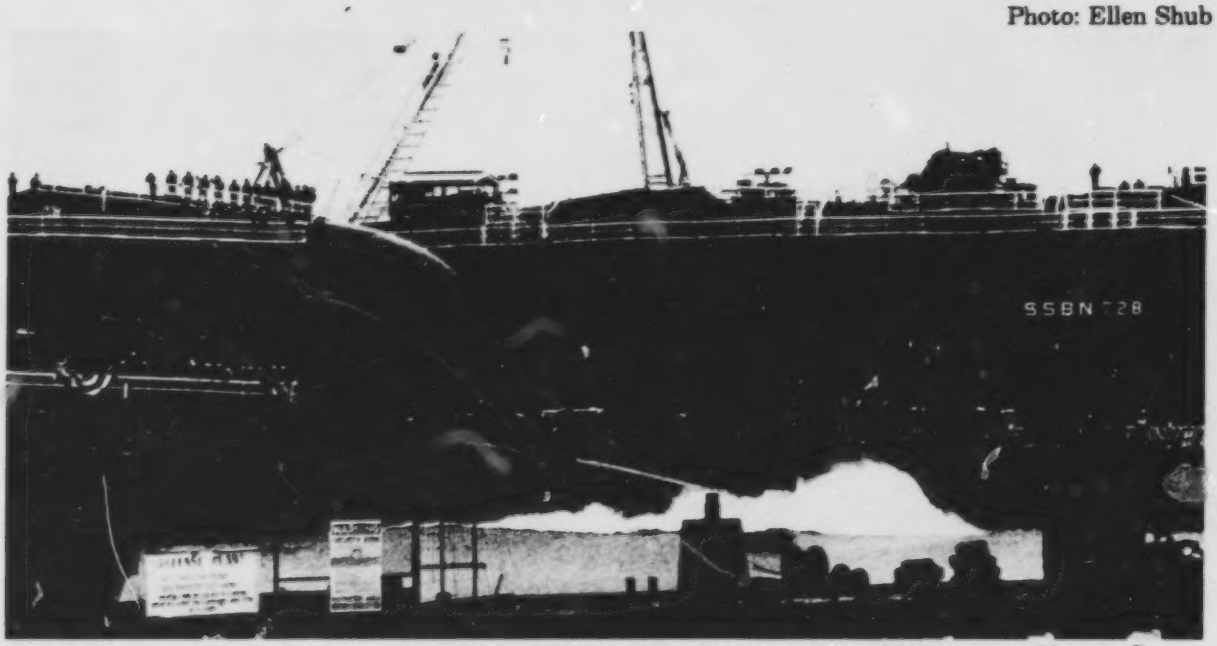
Group 3 Countries that could have nuclear weapons within six years:

Brazil	Argentina
Spain	Belgium
Netherlands	Denmark
Finland	Italy
Austria	Iraq
Taiwan	South Korea
Australia	

Group 4 Countries that could have nuclear weapons in seven to ten years:

Libya	Egypt
Norway	Yugoslavia

Photo: Ellen Shub



Fast-Attack nuclear warhead-carrying submarine being launched from General Dynamic's Electric Boat plant in Groton, Connecticut, April 25, 1981.

7c

WHAT SHOULD WE SPEND OUR U.S. DOLLARS ON?

Priorities of Government Spending

Tomorrow, we are going to begin to look at the military budget in relation to priorities of government spending.

Below are five values statements on priorities for government spending, with two columns preceding the set of statements. In the first column rank each statement from 1 to 5 in terms of what you think best represents the spending priorities of our present administration, with 1 most closely representing their priorities and 5 the least representative of their priorities. In the second column, rank in the same way what you think our government's spending priorities should actually be.

Rank the following statements:

Our gov't	What you think	Statements on Priorities of Government Spending
		The first priority of government spending is to ensure a strong national defense.
		The first priority of government spending is to ensure that there are jobs for all.
		The first priority of government spending is to ensure that we are first in military power so that we can protect our allies and business interests abroad.
		The first priority of government spending is to ensure a minimum standard of living, including housing, education, and health care for all.
		The first priority of government spending is to ensure that our country's businesses are viable so as to be able to compete with foreign businesses.

Now, write why you think your No. 1 choice should be the first priority of government spending. Be specific and give examples for your choice.

DAY EIGHT:

National Security, Natural Resources, and a Healthy Economy

Objectives

To discuss the question of nuclear superiority between the United States and the Soviet Union
To contrast U.S. policies of national security with the nuclear weapons buildup
To explore different methods of ensuring national security

Materials

Photocopies of student worksheets (first page of Worksheet 8b should be cut in half)

Activities

A. Review homework. Take a tally of what students think is the first priority for government spending. Then take a tally of what students think *should be* the first priority for government spending. Discuss:

- Was there a difference between the two votes? If not, why not? If so, why?

Ask for a few student volunteers to read what they wrote in support of the choices they made for priorities for government spending.

B. Divide students into three groups. Tell them they are going to roleplay a scenario concerning which country has nuclear superiority—the United States or the Soviet Union. Pass out to each student the "Who Is Stronger?" worksheet (8a). Pass out to one group the Soviet Delegation role cards, to another group the United States role cards, and to the last group the Special Commission role cards (8b). Tell students that they are all delegates to the United Nations, where a special commission has been assigned to investigate the question of nuclear superiority between the United States and the Soviet Union and to decide what to do about it. Tell each group to read through the nuclear weapons data sheet and then read their role cards. They should then spend ten minutes planning their roles, what they are going to say in the hearing, and who is going to represent them. Each delegation will appoint two representatives to speak before the commission.

Once students have finished planning, have the commission convene the hearing. The directions for conducting the hearing are detailed in the commission's role play card. Let them conduct the hearing through to conclusion. Allow a few minutes for the commission to discuss their findings and come up with a decision. They should then present their decision to the entire class. Discuss:

- Who do you think has nuclear superiority? Why?
- Why could both countries claim that the other has nuclear superiority?
- With the number of nuclear weapons each country has, does it matter if one side has an edge over the other? Why or why not?
- Is it possible for the public to understand everything that happens on this level?
- Should the public be involved in decision-making on nuclear arms?

C. Write on the board the following: NATIONAL SECURITY, NATURAL RESOURCES, A HEALTHY ECONOMY. Tell students that these three qualities are the important ingredients for a healthy country. Discuss:

- How do nuclear weapons ensure our national security?
- Why is each one of these essential to a country's survival?

Give each student a copy of the national security statement of the United States (8c). Ask a student to read the statement aloud to the class. Discuss:

- How do nuclear weapons help ensure our natural resources?
- How do nuclear weapons help ensure a healthy economy?
- Do you agree with the national security statement? Why or why not?

D. Play the Oil Islands game. Divide the class into groups of three. Give each student a copy of the Oil Islands directions and scoresheet (8d). Tell students they are going to play a game that deals with arms and natural resources. Read through the directions together. Tell students to play two to four rounds of the game. After the game, discuss the results:

- What process happened with each group?
- Did efforts to seize the islands create mistrust? Why or why not?
- Did any groups establish trust? How did this happen?
- Which people won the most islands? What was your strategy in winning them?
- Did escalation and the threat of nuclear war prevent you from seizing?
- If any groups did blow themselves up, how did this happen?
- Who lost the most money? How might this drain of funds affect life in your country?
- Did you communicate in any way with each other? How did that affect the game?
- Did you play the game differently the second time around? If so, how?
- How does this game relate to the world situation today?

E. Homework: Give to each student a copy of the "What Concerns You?" questionnaire (8e). Tell them to interview at least two people that evening, using the questionnaire.

Notes:

WHO IS STRONGER?

United States Strategic Forces

	Launchers	Total Number of Warheads	Total Yield in Megatons
Land-based missiles	1050	2150	1650
Sea-based missiles	625	4950	300
Aircraft	350	2400	1600
TOTAL	2025	9500	3550

Soviet Union Strategic Forces

	Launchers	Total Number of Warheads	Total Yield in Megatons
Land-based missiles	1400	5500	6425
Sea-based missiles	950	1250	1250
Aircraft	150	150	2475
TOTAL	2500	6900	10,150

Other Strategic Information

Soviet missiles have greater throw-weight (the capability to carry larger warheads with more explosive power), while U.S. missiles are generally more accurate. The U.S. bombers have greater speed and range than Soviet bombers. U.S. submarines are less noisy than Soviet submarines and are, consequently, more difficult to detect. The U.S. also has the advantage in anti-submarine warfare, but the Soviets have more air defense with which to intercept a bomber attack.

Currently, the Soviets have nuclear missiles stationed along their borders and aimed at neighboring countries, including China and countries in Europe. They claim that they are just protecting their borders, much like U.S. nuclear missiles protect United States' borders. The United States says that if the Soviet Union maintains this arsenal of nuclear weapons aimed at Europe, they are going to install nuclear weapons in Western Europe and aim them at the Soviet Union. This "equality" on the European front, they claim, will prevent the Soviet Union from invading Europe. The Soviet Union claims that NATO already has nuclear weapons positioned in Europe, aimed at the Soviet Union, as both Great Britain and France have nuclear arsenals pointed at the Soviet Union. The United States claims that the nuclear arsenals of both countries are not part of NATO's forces; both countries maintain their own independent nuclear arsenals. Since the United States and NATO don't have control over deployment and use of these nuclear weapons, they should not count as part of their nuclear forces.

ROLE CARDS FOR "WHO IS STRONGER" SIMULATION

Delegation of the Soviet Union

Your group is a Soviet delegation at the United Nations. You have been assigned to appear before a special U.N. commission that is made up of representatives of independent nations around the world. Its purpose is to decide who has superiority in nuclear forces, whether the superiority gives one of the countries a significant advantage over the other, and to decide whether increasing the nuclear arsenals in one or both countries will reduce the risk of nuclear war.

Your task is to convince this commission that the United States has a distinct nuclear superiority over your country, and that this superiority creates a risk to world peace. You want to convince the commission that it would be advisable to recommend halting the production and deployment of U.S. nuclear weapons, and allow the continued production and deployment of Soviet weapons. Use the data sheet to come up with a convincing argument to show that the United States has nuclear superiority over the Soviet Union. Be prepared to back up your arguments with data. Develop a concrete plan to demonstrate what additional weapons the Soviet Union would develop to achieve equality, where they would be situated, and why these weapons would ensure equality and, consequently, reduce the risk of a nuclear war between the two countries.

Appoint two people to make the presentation before the commission.

Delegation of the United States

Your group is a United States delegation at the United Nations. You have been assigned to appear before a special U.N. commission that is made up of representatives of independent nations around the world. Its purpose is to decide who has superiority in nuclear forces, whether this superiority gives one of the countries a significant advantage over the other, and to decide whether increasing the nuclear arsenals in one or both countries will reduce the risk of nuclear war.

Your task is to convince this commission that the Soviet Union has a distinct nuclear superiority over your country, and that this superiority creates a risk to world peace. You want to convince the commission that it would be advisable to recommend halting the production and deployment of Soviet nuclear weapons, and allow the continued production and deployment of U.S. nuclear weapons. Use the data sheet to come up with a convincing argument to show that the Soviet Union has nuclear superiority over the United States. Be prepared to back up your arguments with data. Develop a concrete plan to demonstrate what additional weapons the United States would develop to achieve equality, where they would be situated, and why these weapons would ensure equality and, consequently, reduce the risk of a nuclear war between these two countries.

Appoint two people in your group to make the presentation before the commission.

Special Commission of the United Nations

Your group is a special commission of the United Nations, made up of representatives from independent nations around the world. The purpose of the commission is to determine the following:

- Whether or not either the United States or the Soviet Union has significant nuclear superiority over the other
- If there is significant nuclear superiority, does this superiority increase the risk of nuclear war
- Whether increasing the nuclear arsenal in one or both countries will reduce the risk of nuclear war
- A recommendation to the U.S. and U.S.S.R. as to the continuation of the arms buildup.

Delegations from the Soviet Union and the United States will be presenting their positions on nuclear forces to the commission. Your task as a commission is to moderate the hearing, listen to information that is presented, ask questions, and come to conclusions on the four items above. The procedure of the hearing will be as follows:

1. The United States will present their positions on the nuclear forces question to the commission. The commission may ask questions.
2. The Soviet Union will present their positions on the nuclear forces question to the commission. The commission may ask questions.
4. The commission will allow a brief recess (5 to 10 minutes) to allow both delegations to plan a final speech that includes their requests.
5. The commission will hear the United States present their final statement and make their requests. The commission may ask questions.
6. The Soviet Union will present their rebuttal statement and make their requests. The commission may ask questions.
7. The commission will retire to the corner of the room and come to conclusions on the four purposes of the hearing. The commission will then return to their tables and present their findings to the delegations.

Appoint two people in your group to act as moderators for the first two presentations, two people to moderate the second set of presentations, and another two to present the commission's findings.

WHAT IS THE PURPOSE OF NATIONAL SECURITY?

The basic national security objective of the United States defense program is to prevent war—particularly nuclear war. The purpose of United States national security programs is to deter other nations from threatening our vital interests as well as those of our allies and friends. This deterrence must be based on the maintenance of strategic nuclear capabilities, which make nuclear war with us an unacceptable option; maritime superiority; a strong force posture in NATO and Northeast Asia; and the ability to deploy and sustain our forces worldwide.

National Needs Statement

- Protect America's people, its institutions, and its lands from foreign aggression.
- Deter any attack upon, and prevent the coercion of, the United States, its allies, and friends.
- Protect U.S. economic interests and U.S. citizens abroad.
- Maintain access to critical resources.
- Maintain, in conjunction with our allies, the military capabilities required to counter the expansion of Soviet miltary presence, particularly where such expansion threatens the interests of the United States.

(From the U.S. Office of Management and Budget)

DIRECTIONS FOR OIL ISLANDS GAME

It is the year 2030 and vast oil deposits have been discovered on ten islands in the Bering Straits between the United States and the Soviet Union. Neither country has ever pressed claim to the islands, although each has strong historical and legal reasons for doing so. Now, however, with a serious shortage of oil clearly ahead, both countries consider the islands extremely important.

In your group of three, one person should choose to be the United States, another person should represent the Soviet Union, and the third is referee and scorekeeper. The object of the game is to gain as many islands as possible in order to ensure future natural resources for your country.

During each round of the game (10 rounds total), the United States and the Soviet Union must decide to SEIZE or COOPERATE on an island. With each round, the two players will use hand signals to indicate SEIZE or COOPERATE—a closed fist means SEIZE, while an open palm means COOPERATE. Each player begins with $10 billion to spend.

For each round, the referee will say "1-2-3 GO," and the two players, at the same time, should show either a closed fist or an open palm. If one player shows a closed fist and the other an open palm, the first seizes the oil island but loses $1 billion in the war effort; the second player loses the island. If both show open palms, both cooperate, and share the island. When both show closed fists, both seize and they lose $1 billion each. However, the third time both seize simultaneously, nuclear war breaks out, and both sides lose everything, and the game is over.

The scorekeeper should keep track of gains and losses on the scoresheet.

Play the game twice, keeping the same roles. Then, players should switch roles to allow the referee a chance to play.

SCORESHEET FOR OIL ISLANDS

Use the two scoresheets below to tally gains and losses in money and islands for each game of OIL ISLANDS.

	United States		Soviet Union	
	$	Islands	$	Islands
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Total				

	United States		Soviet Union	
	$	Islands	$	Islands
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
Total				

COMMUNITY QUESTIONNAIRE:

What Concerns You?

Which of the following do you think are problems in your community and in our country today? Circle #1 if you think it is a major problem, #2 if you think it is a minor problem and #3 if you don't think it is a problem.

	Major Problem	Minor Problem	Not a Problem
1. Quality of education in the public schools	1	2	3
2. Opportunities for higher education for everyone	1	2	3
3. Crime	1	2	3
4. Adequate police protection	1	2	3
5. Adequate fire protection	1	2	3
6. Unemployment	1	2	3
7. Trash in the streets	1	2	3
8. Recreational facilities—parks, community schools, pools, etc.	1	2	3
9. Quality of health care	1	2	3
10. Public transportation	1	2	3
11. Availability of housing	1	2	3
12. Adequate care for the elderly	1	2	3
13. Road and highway conditions	1	2	3
14. Price of consumer goods	1	2	3
15. Pollution	1	2	3
16. Inflation	1	2	3
17. Availability of assistance for the needy	1	2	3
18. Enough food for all	1	2	3
19. Protecting our country from attacks	1	2	3
20. Threat of nuclear war	1	2	3

Other?

DAY NINE:

The Environment and Military Spending

Objectives

To evaluate allocations of resources by comparing military spending with social spending

Materials

Photocopies of student worksheets

Activities

A. Review homework. Tally the results of the questionnaires students completed. Write the results on the board to show the range of reactions for each question. Discuss:

- What concerned a large percentage of people?
- Why do you think these problems exist?

B. Tell students that they are going to spend the class evaluating military spending versus social and environmental spending. Give each student a list of the environmental problems our country is facing (9a). Tell students to read the directions and write down a problem and proposed solution for each ecological category. Allow students ten minutes to fill out the sheet. Then go over each category and have students share the problems and proposed solutions they have. Discuss:

- Why do you think these problems exist?
- What resources would we need to enact some of the proposed solutions?
- Do you think these problems are being addressed adequately by our government? If not, why aren't they?

C. Divide students into groups of four to six. Give each group a blank budget worksheet (9b) and the blank bar graph worksheet (9c). Tell students that they are to construct a national budget for the country, keeping in mind the environmental and social needs and the need for national security. Each group has $100 billion dollars to disburse to all areas of the budget. Their task is to agree on how to disburse all the money so that it best serves the needs of national security and the needs of the people in the United States. Note that some of their allotted money has already been used to pay off interest on the national debt. (Most every country has a national debt, money borrowed from its own treasury or world banks. The money listed on their sheet approximates the percent of the U.S. budget that goes toward the interest on our national debt.) All the money should be disbursed among the remaining thirteen areas of the budget, although money does not have to be given to every area. Once a group is finished, have them use Worksheet 9c to construct a bar graph depicting their budget decisions. Allow students ten to twenty minutes to work on their budgets and graphs. When all groups are finished, reassemble the class. Have each group pick a representative to present the group's decision and explain their graph. Tell students that in the proposed 1986 budget, the percentage of money allocated to defense spending will have risen from 34% to 40%. Discuss:

- How did your budget reflect concerns for environmental and social needs?
- How did your budget reflect concerns for national security?
- Why did you choose the priorities you did?
- What process did you use in your groups to arrive at your decisions?

D. Distribute the sheet containing the proposed budget figures for 1983 (9d). Also included is a Teacher Resource Sheet of the actual U.S. proposed budget as prepared by the Office of Management and Budget (9e). Have students look at the first sheet and discuss:

- How do these figures compare with the ones each group decided upon?
- What priorities for national security does the 1985 budget express?
- Do you agree with the decisions made on budget distribution? Why or why not?

(Note: Considerably more money goes to national defense than is in the national defense budget. Dollars from the International Affairs and Science Departments' budget go to foreign military aid; dollars from the Energy Department go towards research and development of nuclear weapons. A considerable portion of the national debt, to which money from the budget is paid as interest each year, stems from past wars. In reality, it is estimated that 55% to 63% of the United States budget goes to military-related spending.)

E. Hand out the cutbacks sheet (9f) and the gains sheet (9g). Have students read each. Tell students these were the cuts and gains in the 1982 United States budget. This was President Reagan's first budget.

- What kinds of programs received cuts in their budgets?
- What effect do you think cuts will have on these programs?
- What kinds of programs received increases in their budgets?
- What effect do you think these increases will have on the programs?
- Do you think there are any correlations between the concerns people expressed in the questionnaire and the specific programs that received cutbacks or increases? If so, what? If not, why?

F. Homework: Tell students to write a page describing how they would like to envision the world in the year 2000.

Notes:

OUR ENVIRONMENT: WHAT CONDITION IS IT IN?

Today, our country is facing environmental and ecological problems that it has not experienced before. Many of these problems have reached critical stages that must be addressed. For each category below, list a problem and a possible solution to that problem. Think of issues that you have read about in the newspaper, have heard conversations about, or have studied.

Areas of Our Ecology	Current Problem	Current Solution
Air		
Water		
Land		
Energy		
Community Planning		
Food		
Health		
Education		

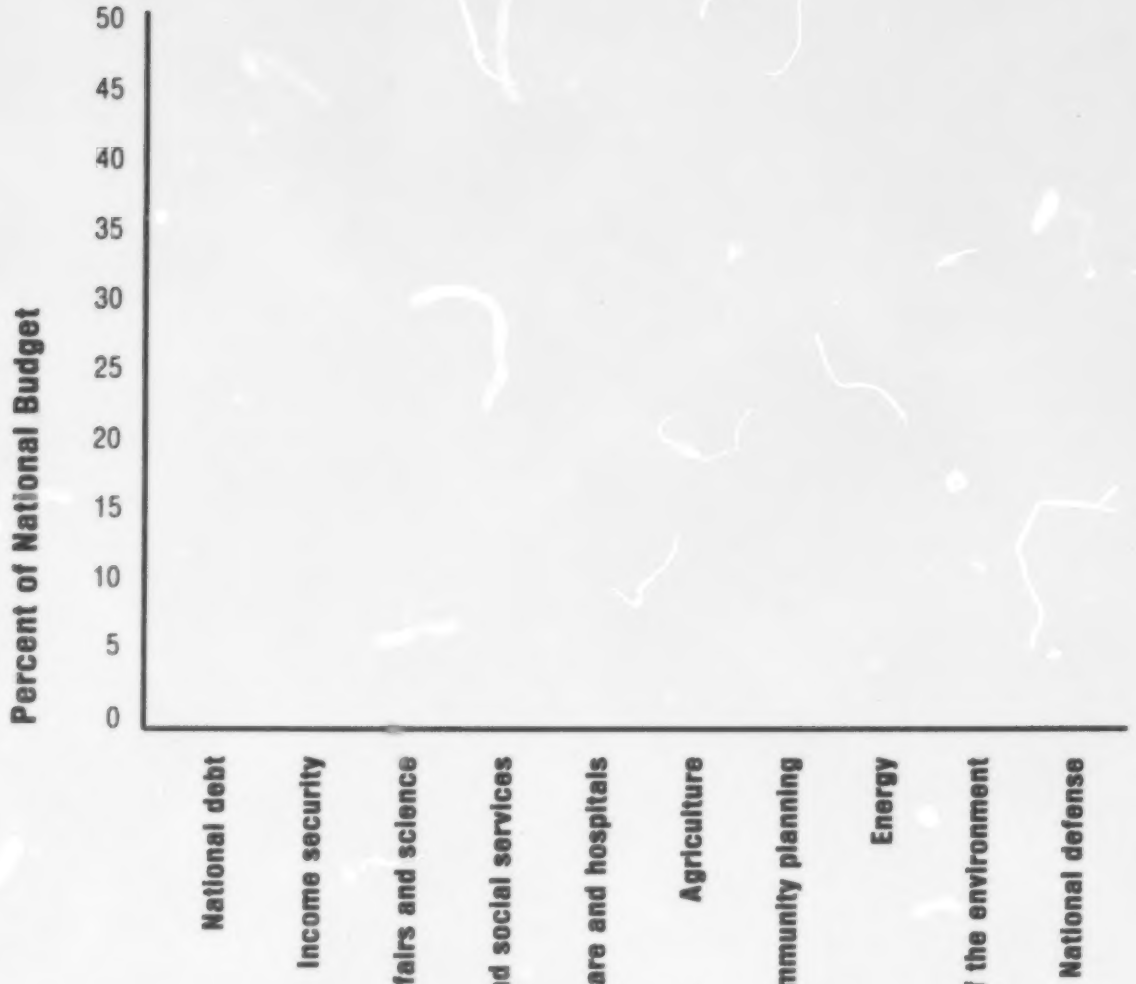
BUDGETING FOR THE WELFARE AND NATIONAL SECURITY OF OUR CITIZENS

Below are listed 14 categories. These are categories that make up the budget of the United States. The task of your group is to decide how much money to spend on each category while taking into account the welfare of the citizens and the needs for national security. Your group has a total of $100,000,000,000 or $100 billion to spend. Note that category 14 already has a cost assigned to it. This is money owed by the country to pay back money it has borrowed. It is a given amount each year that is determined by deficits accumulated in previous years. So, in reality, you have just $89 billion to work with instead of $100 billion. All the remaining money should be disbursed among the other 13 categories, although money does not have to be given to each and every category. Distribute the money in billions of dollars.

Once you have created your national budget, construct a bar graph showing your decisions. Be ready to present your final budget and graph to the class.

Category	Amount
1. National defense a. Armed forces b. Conventional weapons c. Nuclear weapons	
2. International affairs and diplomacy (e.g., World Bank loans, foreign economic and military aid)	
3. Science, space, and technology (e.g., NASA)	
4. Energy (e.g., nuclear, solar, and geothermal research and development)	
5. Natural resources and environment (e.g., care and protection of wildlife and land)	
6. Agriculture (e.g., dairy and grain subsidies)	
7. Business and housing development (e.g., public housing, small business loans, private subsidized housing)	
8. Transportation (e.g., mass transit, roadbuilding)	
9. Community and regional development (e.g., business subsidies, city redevelopment)	
10. Education, job training, and social services	
11. Health care and hospitals	
12. Income security (Social Security, retirement, and unemployment)	
13. Administration of government and justice (e.g., law enforcement, Legal Services)	
14. Interest on the national debt (a fixed cost) (money owed to the Treasury from past borrowings)	$ 11 billion
Total	$100 billion

GRAPHING THE NATIONAL BUDGET



THE 1983 BUDGET

The 1983 national budget is shown below in a simplified form.

Read through this budget and compare these figures to the budget your group created. How similar are they? What were the differences?

Category	Percent	Amount (in billions)
1. National defense	29.0	$239.2
a. Armed forces	(14.5)	(119.3)
b. Conventional weapons	(11.6)	(96.0)
c. Nuclear weapons	(2.9)	(23.9)
2. International affairs and diplomacy	1.5	11.9
3. Science, space and technology	1.0	7.8
4. Energy	0.5	4.5
5. Natural resources and environment	1.5	12.1
6. Agriculture	2.5	21.1
7. Business and housing development	0.5	1.9
8. Transportation	2.5	21.9
9. Community and regional development	1.0	7.4
10. Education, job training, and social services	3.0	26.7
11. Health care and hospitals	10.0	82.4
*12. Income security—benefits for the needy (Social Security, retirement, & unemployment)	34.0	282.5
13. Administration of government and justice	2.0	17.5
*14. Interest on the national debt (a fixed cost)	11.0	88.9
Total	100.0	825.8

*These categories are fixed, meaning they are not adjustable when determining the budget each year. The figures are determined by budgets of previous years.

Statistics compiled from the U.S. Office of Management and Budget

The 1983 Budget

Table 3. **BUDGET OUTLAYS BY FUNCTION, 1982–88**
(In billions of dollars)

	1982 actual	Estimate					
		1983	1984	1985	1986	1987	1988
National defense	(187.4)	(214.8)	(245.3)	(285.3)	(323.0)	(354.3)	(385.6)
Military personnel	42.3	45.3	47.7	49.5	51.0	52.1	53.0
Retired pay	14.9	16.1	16.8	17.4	18.4	19.3	20.1
Operation and maintenance	59.7	64.6	71.6	79.1	87.3	95.7	103.1
Procurement	43.3	55.2	68.2	85.9	103.7	117.5	131.4
Other [1]	27.2	33.5	41.0	53.4	62.7	69.6	78.0
International affairs	10.0	11.9	13.2	13.0	12.9	12.6	12.6
General science, space and technology	7.1	7.8	8.2	8.4	7.9	7.7	7.1
Energy	4.7	4.5	3.3	2.7	2.8	2.8	3.2
Natural resources and environment	12.9	12.1	9.8	9.3	8.7	8.3	8.0
Agriculture	14.9	21.1	12.1	10.7	9.5	9.8	10.0
Commerce and housing credit	3.9	1.9	.4	−2.3	−2.8	−2.3	−3.0
Transportation [2]	20.6	21.9	25.1	26.2	27.0	27.8	28.2
Community and regional development	7.2	7.4	7.0	7.0	6.8	6.7	6.7
Education, training employment, and social services	(26.3)	(26.7)	(25.3)	(25.1)	(24.8)	(24.8)	(25.1)
Education	14.3	14.4	13.5	13.3	12.9	12.9	13.1
Training and employment and other labor	6.0	5.7	5.3	5.2	5.2	5.3	5.3
Social services	6.0	6.5	6.4	6.6	6.7	6.7	6.7
Health	(74.0)	(82.4)	(90.6)	(100.5)	(109.6)	(121.0)	(133.5)
Medicare	46.6	53.0	59.8	67.5	74.5	83.4	93.1
Medicaid	17.4	19.4	20.9	23.2	25.4	27.9	30.6
Other	10.0	9.9	10.0	9.8	9.7	9.7	9.8
Income security	(248.3)	(282.5)	(282.4)	(294.6)	(311.4)	(327.7)	(346.3)
Social security	154.1	168.3	178.2	191.8	205.9	221.1	236.8
Other general retirement	7.7	7.9	7.4	6.8	7.7	7.3	8.0
Federal employee retirement	19.4	20.9	22.2	23.1	25.0	26.5	28.1
Unemployment compensation	23.8	36.9	28.8	25.9	24.7	23.7	22.5
Housing assistance	8.0	9.6	10.8	11.9	12.5	12.8	13.1
Food and nutrition assistance	15.6	17.8	16.3	16.3	16.6	17.1	17.5
Other income security	19.8	21.1	18.7	18.9	19.0	19.3	20.4
Veterans benefits and services	24.0	24.4	25.7	26.5	27.2	27.9	28.9
Administration of justice	4.7	5.3	5.5	5.5	5.5	5.5	5.6
General government	4.7	5.8	6.0	6.0	6.1	6.1	6.4
General purpose fiscal assistance	6.4	6.4	7.0	6.8	7.1	7.3	7.5
Net interest	84.7	88.9	103.2	114.2	122.7	130.4	134.3
Allowances:							
Civilian agency pay raises				1.8	3.8	5.8	7.9
Increased employing agency payments for employee retirement			.9	1.9	1.9	1.9	1.9
Undistributed offsetting receipts:							
Employer share, employee retirement	−7.0	−8.2	−9.9	−11.5	−12.0	−12.4	−12.8
Rents and royalties on the Outer Continental Shelf	−6.2	−11.8	−11.9	−12.2	−13.4	−14.4	−15.1
Federal surplus property disposition		−.4	−1.0	−.9	−1.0	−.9	−.9
Total budget outlays	**728.4**	**805.2**	**848.5**	**918.5**	**989.6**	**1,058.4**	**1,126.9**

[1] Includes allowances for civilian and military pay raises for Department of Defense—Military
[2] Includes allowances for military pay raises for the Coast Guard

From *Budget of the United State Government, Fiscal Year 1984*, Office of Management and the Budget.

CUTBACKS IN THE UNITED STATES 1982 BUDGET

1982 was a year in which there were significant changes in federal spending priorities from previous years. The 1983 budget you looked at is a reflection of these spending priority changes.

Following are 26 major programs that were cut in President Reagan's fiscal year 1982 budget, along with the dollar amounts cut and the percentage of each program's cuts. In all, there were 48 major programs in the budget that received cuts. The Department of Defense is the only department that didn't receive any cuts. Look through this list and consider the consequences of these cuts.

Program	Dollars Cut	% of Program Cut
AFDC—Welfare	900 million	12
Low-income fuel assistance	100 million	.5
Food Stamps	1.2 billion	10
Child nutrition	500 million	10
Food for Peace	200 million	18
Title I—Education	230 million	7
Bilingual Education	23 million	14
Student Financial Aid	450 million	11
Student Loan	500 million	30
Arts and Humanities	38 million	12
Community Health	250 million	22
Health Planning	64 million	50
Preventive Health	54 million	16
CETA—Comprehensive Employment Training Act	4.4 billion	60
OSHA—Occupational Health and Safety Act	29 million	14
Consumer Product Safety	10 million	24
Legal Services—legal aid for the poor	180 million	24
UMTA—mass public transportation	1.7 billion	24
Amtrak—public railways	146 million	16
Solar Energy	185 million	41
Geothermal Energy	88 million	63
Conservation—environmental protection	219 million	48
Fish and Wildlife—protection of wildlife	30 million	10
Land and Water Fund	230 million	100
New Public Housing	7.6 billion	30
Community Development Block Grants	330 million	6

The total amount of cuts to major programs in the budget is $30,251,000,000.

Questions to consider:

- How do these cuts affect our quality of life now and in the future?
- Most of this money was transferred to the defense budget. Would you make the choice to take money from domestic programs to build up the military? Why or why not?

(Figures compiled from the *Boston Globe*, January 18, 1982)

PROGRAMS THAT RECEIVED INCREASED MONIES

United States 1982 Budget

1982 was a year in which there were significant changes in federal spending priorities from previous years. The 1983 budget you looked at is a reflection of these spending priority changes.

Following are 17 major programs that received increases in federal dollars for their 1982 budgets. As you can see, except for the last five, all programs are defense-related. In fact, military spending was approved $31.1 billion above the previous year's budget. Included in this amount was $16.8 billion targeted for defense procurement, mostly nuclear weapons.

Program	Dollars Gained	% of Program Gains
Defense research and development	2.3 billion	20
NASA research and development	430 million	10
Procurement—buying of weapons	16.8 billion	35
Operation and maintenance of weapons	5.5 billion	10
Personnel—armed forces	1.2 billion	3
Military construction	1.8 billion	32
Atomic energy—nuclear research	1.0 billion	28
Foreign military aid	327 million	51
Nuclear power research and development	64 million	7
Economic Support Fund—foreign aid	472 million	22
AID development assistance—foreign aid	110 million	9
World Bank loans—foreign aid	200 million	40
Head Start—day care	94 million	11
Medicaid—health care for the needy	850 million	5
Education for the handicapped	57 million	6
National Institutes of Health	80 million	2
Operating subsidies—for public housing	90 million	7

The gains in these seventeen programs represent $31,204,000,000.

Questions to consider:

- Compare the total amount of cuts to the total amount of gains in these programs. What is happening to this budget?
- Do you agree this should happen? Why or why not?

(Figures compiled from the *Boston Globe*, January 18, 1982)

DAY TEN:

Putting the Pieces Together

Objectives

To review briefly key concepts covered in the curriculum
To review actual proposals in Congress about national defense and spending priorities
To discuss the responsibilities of an informed citizenry
To do a final project that ensures that students take action according to their own personal beliefs

Materials

Photocopies of student worksheets

Activities

A. Ask for two to five volunteers to read what they wrote for homework as a vision of 2000. Discuss:

- Does this vision differ from what you think the world will be like in 2000? If so, how is it different? Why do think it will be this way?
- If it is different, what can we do to bring the world closer to what you would want the world to be like?

B. Review quickly some of the key concepts covered in the curriculum. Write the following on the board:

national security
threat of nuclear war
the arms race
military spending
quality of life

Ask students to explain what each phrase means to them. Encourage them to refer to specifics covered in the curriculum.

C. Explain that you will look at some of the actual proposals being debated in Congress that relate to these various issues. Hand out the National Security Options sheet (10a). Review the proposals to ensure that students understand them.

D. Tell students that they will play U.S. Representatives. They are to decide which option from the sheet they support the most. Each representative's goal is to convince the other representatives to vote for that option. Tell students that you will be the Speaker of the House and will recognize them to speak. They should present their views briefly but persuasively. Allow them to choose their own option. If not all options are covered, assign them to some students.

E. Pass out the Action Sheet (10b) to students. This sheet provides suggestions for possible student actions on the issues in the curriculum.

Discuss quotation from former President Jimmy Carter about active, responsible citizenry:

- How important is free debate in our society? Should there be a limit on it?
- Do you agree that "if the system is to work, all of our people must participate?" Why or why not? What if people do not participate?
- What responsibilities does Carter feel an American citizen has?

Then refer students to the five issues put on the board at the beginning of the class. Tell them that for a final project they must pick one of these issues and, using the suggested activities (or their own ideas), decide upon a method to voice their own opinion in this matter. You may want students to do this in small groups by interest, or the class may decide together on a project. This can also be an additional means of evaluation for you.

Notes:

OPTIONS FOR NATIONAL SECURITY

1. Bilateral Disarmament

Both the United States and the Soviet Union would agree to reduce gradually their numbers of weapons. There would be a system of monitoring each side's activities to ensure that the treaty is respected.

2. Unilateral Disarmament

The United States would decide to reduce arms regardless of what the other side does. Our country makes no demands on the Soviet Union and acts on good faith to encourage peace.

3. Mutual Freeze

Both the United States and the Soviet Union agree to halt new weapons development, testing, and deployment. They do not agree to reduce arms. The freeze does not allow the countries to equalize their holdings but stops development at present levels.

4. No First Use

The United States pledges that it will not, under any circumstances, be the first country to use nuclear weapons against another. The United States would use its nuclear arsenal only if it was attacked with nuclear weapons by another country first.

5. Expand Communications

In order to build more mutual confidence between the United States and the Soviet Union and to lessen the possibility of a mistake or misunderstanding, the two countries commit themselves to improving communications. Ways of doing this include expanding the uses of the hotline between Moscow and Washington, D.C., establishing a military crisis center that involves both countries, and agreeing to give advance notification of any missile testing.

6. Build the MX Missile

The United States would build 100 MX missiles and deploy them in one cluster in Wyoming. The MX missile contains 10 to 25 one-megaton nuclear warheads, the largest and most accurate weapon built to date. The MX missile would make our land-based missile system equal or superior to that of the Soviets.

7. Increase Conventional Weapons

Rather than build more nuclear weapons, the United States would concentrate its defense spending on expanding its non-nuclear arsenals. A draft could be instituted to enlarge the armed forces. More tanks, jet fighters, aircraft carriers, non-nuclear submarines, etc. would be built so that we can still protect ourselves and our interests, but not increase the threat of world destruction.

ACTION SHEET

"It's Up to the People"

"Our system of government rests on the assumption that in an open society, with free debate and access to the facts, truth would eventually overcome error. . . . But if the system is to work, all of our people must participate. We all must train our minds to learn the facts and understand the issues. We must all vote and make our wishes known. All of our citizens must stand against injustices to any one of them. . . . If they are apathetic, government will be apathetic. But if the people care—and show it—the government will act. How wisely and how effectively is largely up to the people. . . ."

Former President Jimmy Carter, from *Perspectives*, 1977, Close Up Foundation, Washington, D.C.

Activities

The thought of nuclear war is paralyzing to many people. To some, it is a necessary evil that we must endure to ensure our national security. To others, it is a force that threatens humankind, while the arms race siphons funds away from programs that improve our quality of life. Some people feel that we need more money for defense, others believe we must re-direct public money toward domestic social programs. Whatever you believe, it is important to act on those beliefs. If you don't, you will find that decisions will be made without your input and you will feel increasingly powerless. Below are some things you can do in your school and community.

1. *Write a letter to your state or federal elected officials.* Ask for their views on the issues of arms limitation and military vs. social spending. Tell them what your opinions are. Letters or Western Union mailgrams can be especially effective if you can get a letter writing campaign going. Start one in your school or community organization.

2. *Run a referendum in your school.* It is a good way to get people thinking about the choices we have before us. It could be patterned after a real referendum question or you can draft your own highlighting concerns in your school.

3. *Plan a forum at your school.* You could show a film or slides or invite some outside speakers and hold a debate.

4. *Have a contest to design a poster.* Some topics could be pros and cons of the arms race *or* the "Soviet threat."

5. *Write and perform a skit* for the class or for a school assembly.

6. *Set up a bulletin board* that highlights the issues your class found particularly relevant or controversial. You could do an informational display or have two sides of a particular issue represented.

7. *Write a letter to the editor* of your local newspaper.

INFORMATIONAL AND CURRICULAR MATERIALS

For Teachers

Abrams, Grace and Schmidt, Fran. *Learning Peace.* Philadelphia: Jane Addams Peace Association, 1972. 50 pp. Age range: grades 7-12. Useful bibliography: books, films, list of peace organizations.
Activities and assignment ideas on: global conflict resolution, distribution of world resources and population, nationalism, world problems, and international organizations.

Bressler, Marion A.. and Bressler, Leo A. *Peace or War.* Englewood Cliffs, N.J.: Prentice-Hall, 1977. American Problems series, ed. J.R. Fraenkel. Paper, 120 pp.
Chapters on the nature of war, causes, effects, alternatives. Selections from writings about war: Anne Frank, *All Quiet*, poetry of Wilfrid Owen, survivor of Hiroshima; also some cartoons, illustrations. Questions and suggested activities at each chapter end.

Educating for Peace and Justice: Manual for Teachers in 4 volumes (prices include postage).
I. National Dimensions $9.00
II. Global Dimensions $9.00
III. Religious Dimensions $9.00
IV. Teacher Background Readings $5.00
Available from the Institute for Peace and Justice, 2747 Rutger, St. Louis, MO 63104
Units contain teaching strategies for elementary, secondary, and college levels; action possibilities, student readings, case studies, bibliographies.

"Final Document: Special Session of the General Assembly on Disarmament." U.N. Department of Public Information, New York 10017, 1978. 26 pp. (pamphlet) free.
Comprehensive outline of need for and steps toward achieving disarmament. Nuclear disarmament a priority. Stages: 1) cessation of improvement of weapons; 2) cessation of production; 3) progressive reduction of stockpiles. Nuclear-free zones a positive step. Format monotonous.

Sivard, Ruth Leger. "World Military and Social Expenditures 1981." Order from: World Priorities, Inc., Box 1003, Leesburg, VA 22075. 44 pp. $4.00/copy, $2.50 for 25 copies or more.
A worldwide statistical picture of military and social expenditures—alliance by alliance, area by area; charts, tables, maps, etc. This is an annual accounting of the use of world resources for social and military purposes.

"Teaching Global Issues through Simulation: It Can Be Easy," *Intercom* 75. Center for War/Peace Studies, 1974. Paper, 32 pp. Adult level.
Entire issue devoted to simulation games which help teach global issues. The what, why, and how of simulation games is discussed.

Ground Zero, *Nuclear War: What's In It For You?* N.Y.: Simon and Schuster Pocketbooks, 1982. $2.95.

For Students

"Armaments or Disarmament? The Crucial Choice." Stockholm International Peace Research Institute, 1978. 32 pp. (pamphlet). This brief but informative overview of world investments in advanced weapons of mass destruction; of the social, economic, and environmental costs of this arms race; and of past achievement and future prospects for arms control can serve as a useful introduction to a consideration of the question posed in its title.

Boston Study Group, *The Price of Defense.* N.Y.: *New York Times* Books, 1979. Order from *The Nation*, 72 Fifth Ave., New York 10011. $4.95
This book describes our weapons systems, explains why they "exceed military needs," and offers an alternative plan for reducing our military equipment without sacrificing adequate defense.

Caldicott, Helen. *Nuclear Madness—What You Can Do.* Brookline, MA: Autumn Press, 1978. 120 pp. $3.95
Helen Caldicott's struggle against atmospheric testing; effects of radiation, description of fuel cycle, problem of waste disposal, danger of plutonium, arms race—mutual assured destruction, appeal for action.

Fraenkel, Carter, Reardon. *Peacekeeping.* N.Y.: Institute for World Order, Inc., Random House. Perspective in World Order Series, ed. Fraenkel. 1973. Paper, 71 pp. Level: high school/college.
Various peacekeeping models described in sections, each section containing description of case, "what might have happened," "what did happen." Ethiopia 1934, The Congo 1960, Cuba 1962, Malaysia 1969—future, hypothetical case of how world order might work.

Lens, Sidney. *The Day before Doomsday.* Boston: Beacon Press, 1977. 274 pp. $5.00
Sidney Lens writes a history of U.S. nuclear arms from Hiroshima to the administration of Gerald Ford. Lens details those occasions in which the U.S. government has considered the use of nuclear weapons since Hiroshima-Nagasaki, and calls for popular mobilization to reverse the drift toward doomsday.

Metcalf, Reardon, Colby. *The Cold War and Beyond From Deterrence to Detente—to What?* N.Y.: Institute for World Order, Inc., Random House. Crises in World Order Series, ed. Metcalf, 1975. Paper, 71 pp. Level: high school/college.
Case studies: Hungarian Rebellion, Cuban Missile Crises, Arab-Israeli 1973 War. Each section begins with account of what happened with a chronology, photographs; ends with suggestions for study useful for information, starting discussions.

Reardon, Colby. *War Criminals, War Victims.* N.Y.:Institute for World Order, Inc., Random House, 1974. Crises in World Order Series, ed. Metcalf. Paper, 55 pp. Level: high school/college.
Cases: Andersonville, Nuremburg, Hiroshima, My Lai. Considerations of war and the individual through these four histories. Photos and transcripts of trials; suggested questions and issues for study.

Sharp, Gene. *Making the Abolition of War a Realistic Goal.* N.Y.: Institute for World Order, 1980. Paper, 14 pp. (pamphlet)
This tightly reasoned essay offers valuable descriptions of the nature of war, the meaning of defense, and the circumstances under which a "civilian based defense" would be a practical, preferable alternative to defense based on military force and the use of violence.

AUDIOVISUAL AIDS

These audiovisual aids are available through Audio-Visual Resources for Social Change at the following address, unless otherwise indicated:

To reserve a film or slide show, please phone the AFSC Film Library:
2161 Massachusetts Ave.
Cambridge, MA 02140
617 661-6130

The AFSC Film Library is a part-time operation and it is quite possible the librarian will not be in when you call. In this case, please leave your number and the call will be returned.

Films

Paul Jacobs and the Nuclear Gang. 16mm color, 1979, 60 min.
Dramatic story of the cover-up by the U.S. Nuclear Program of the hazards of radiation to American citizens.

Hiroshima: A Document of Atomic Bombing. B/W with some color, 30 min. Produced in Japan.
Japanese photographers documented the suffering inflicted by the American use of the atom bomb on Hiroshima.

War without Winners. 16mm color, 1978, 28 min.
A look at arms control from the point of view of common people. Moving segments of Eisenhower's speeches against development of nuclear arsenals. Includes interviews with Russians and Americans on the street and arms control specialists. Narrated by Rear Admiral Gene R. LaRocque, U.S. Navy.

Clouds of Doubt. 1980, 50 min.
Covers the Nevada atomic bomb tests and government suppression of medical consequences to military personnel and nearby residents, many of whom became victims of cancer and related radiation-induced ailments. From Physicians for Social Responsibility.

NO-FIRST-USE: Preventing Nuclear War. 16mm, color, 1982, 30 min.
Available from Union of Concerned Scientists, 1384 Massachusetts Ave., Cambridge, MA 02238. Emphasizes the need for a major shift in U.S. defense policy, and shows we can both lessen the threat of nuclear war and improve our national security. Features a number of prominent experts.

Slides

Transfer: From Military Spending to Human Needs. Slides with script, 1977, 25 min.
Clearly demonstrates how money put into educational and social programs could better stimulate the economy (and provide more jobs) while providing more for human development than a stockpile of costly weapons.

The Biology of Nuclear War. Slides with script, 1982, 20 min.
Available from Carolina Biological Supply Co., Burlington, NC 27215. Excellent description of the biological effects of a nuclear war.

Slide Shows

Acceptable Risk? The Nuclear Age in the U.S. Slide show with cassette, 1980, 35 min.
A step-by-step overview of the production of nuclear power and nuclear weapons, from uranium mining to electricity, bombs, and radioactive waste.

The Race Nobody Wins. Slides with cassette tape, 1981, 15 min.
A presentation on the dangers and costs of the international arms race. Baffling technology is explained in plain English. Tony Randall, narrator.

The November 11th Convocation: The Threat of Nuclear War. Slides with script and tape, 1981, 30 min.
Available from Union of Concerned Scientists, 1384 Massachusetts Ave., Cambridge, MA 02338. Depicts the history of the nuclear arms build-up. A thorough look at U.S. and Soviet weaponry as well as the effects of a nuclear explosion.

The following five slide shows are available from the Packard Manse Media Project, Box 450, Stoughton, MA 02072 (617-344-3259).

Hostage at Hell's Bottom: The Economy and the Pentagon. Slides with script and cassette, 1982, 19 min.
Dramatically demonstrates connections between increased military spending and unemployment, inflation, cutbacks, drain on industrial capacity, and national security. Highlights economic conversions as a goal.

I Have Three Children of My Own. Slides with script and cassette, 1979, 20 min.
Features Dr. Helen Caldicott on the medical implications of nuclear power and nuclear waste on human life. The person and political dimensions are brought together in compelling combination.

John, Marv, MIRV and MARV. Slides with script and cassette, 1979, 15 min.
Focuses on the nuclear arms race, the cold war system perpetuated by the U.S. and U.S.S.R., and the real meaning of national security.

No Jobs Is Bad Music. Slides with script and cassette, 1979, 20 min.
Dispels the four major myths about unemployment. Interviews with unemployed workers personalize the harsh reality and bring to light the facts.

The Last Slideshow. Slides with script and cassette, 1983, 20 min.
The history of weapons imagined, then built, then used, leading to a precarious balance of terror between the U.S. and U.S.S.R. Concludes on a hopeful, empowering note, with current headlines and June 12th.

Videocassettes

Classified Critical: Can We Survive this Century? 30 min.
TV documentary.

The Last Epidemic. 48 min. color videocassette.
Debunks the notion that there would be survival after an exchange of nuclear weapons. Shows what the aftereffects of a 20-megaton bomb would be on San Francisco.

Mobilization for Survival Audio-Visual Guide resources: 3601 Locust Walk, Philadelphia, PA. 19104 (215 386-4875).

Nuclear Power: Miracle or Menace? 1979, 25 min. color slides.
Produced for Mobilization for Survival by Dr. Michio Kaku, noted theoretical physicist, who carefully develops the case against nuclear power by providing a concise analysis of historical events and current data and the weapons link.

The Other Victims of Hiroshima and Nagasaki. 30 min. color video.
About the thousands of U.S. servicemen who entered the cities after the bombings to do clean-up. From Rick Schmeichen.

Commentary or annotations on audiovisual materials came from: Mobilization for Survival, Audio-Visual Resources for Social Change (sponsored by American Friends Service Committee), and a "New Call for Peacemakers" by Maynard Shelly.

BIBLIOGRAPHY

Adams, Ruth, and Cullen, Susan, ed. *The Final Epidemic: Physicians and Scientists on Nuclear War.* Chicago, IL: Educational Foundation for Nuclear Science, 1981. Paper, $4.95.
A collection of talks by leading experts at symposia organized by Physicans for Social Responsibility and Council for A Livable World Education Fund.

Arkin, William F. *Research Guide to Current Military and Strategic Affairs.* Washington, D.C.: Institute for Policy Studies, 1981. Paper, $5.95.
An extremely thorough and invaluable guide for serious research on weapons and security issues.

Barton, John H. *The Politics of Peace: An Evaluation of Arms Control.* Stanford, CA: Stanford University Press, 1981. Hardback, $18.50.
An exceptionally useful broad-brush treatment of the causes of war and the need for arms control, the impact of contemporary arms control, and techniques for implementing and enforcing arms control.

Beeferman, Lawrence, ed. "Cambridge and Nuclear Weapons." Cambridge, MA: City of Cambridge, 1981. (pamphlet)
This pamphlet, commissioned by the Cambridge City Council in reaction to their view of the State Civil Defense plan, outlines the devastation which would result from a nuclear attack and suggests that prevention is the only valid form of defense.

Betts, Richard K., ed. *Cruise Missiles: Technology, Strategy, Politics.* Washington, D.C.: Brookings Institution, 1981. Paper, $15.95.
The U.S. will soon have thousands of unmanned, jet-powered, nuclear-tipped missiles on its bombers, submarines, surface ships, and in NATO facilities in Britain and Europe. This compendium of experts' assessments reveals how little we know about the ultimate desirability and arms control impact of these missiles.

"The Effects of Nuclear War—Summary." Washington, D.C. 20510: Congress of U.S./Office of Technology Assessment, 1980. (pamphlet)
Government assessment of the short- and long-term effect of nuclear war, social and economic as well as physical. Avoids consideration of military effects, but does examine full range of nuclear attacks.

Fallows, James. *National Defense.* New York: Random House, 1981. Paper, $4.95.
A lucid, well-documented journalist's critique of American military preparedness, emphasizing overly complex weaponry, unimaginative leadership, and bureaucratic shortsightedness.

Fisher, Roger, and Ury, William. *Getting to Yes: Negotiating Agreement Without Giving In.* Boston: Houghton Mifflin, 1981. Hardback, $10.95.
Using examples from international conflicts and other areas, the process of negotiation is analyzed to critique conventional positional bargaining and to explain how to do interest bargaining for mutual gain.

Gansler, Jacques S. *The Defense Industry.* Cambridge, MA: MIT Press, 1982. Paper, $9.95.
The author criticizes the defense industry for lack for efficiency, excessive dependence on international markets, inability to adjust to purchasing cycles, and lack of over-all structural planning, and he proposes some solutions.

Hersey, John. *Hiroshima.* New York: Bantam Books, 1946. Paper, $2.25.
A classic journalistic account, first published in *The New Yorker* magazine in 1946, on the dropping of the A-bomb on Hiroshima and the events which followed, told in terms of the daily lives of the survivors.

Ibuse, Masuji, *Black Rain.* Trans. from Japanese by John Bester. Tokyo: Kodansha International Ltd., 1969, $4.95.
This novel is about a family who lived through Hiroshima in 1945. Their day to day concerns give a vivid picture of this period in the lives of local people.

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Going beyond quantitative casualty and damage estimates, this study projects the extent of destruction of the social and economic order and of political institutions that would occur in limited and full-scale war scenarios.

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New Boston Review, December 1981. (monthly)
A full issue of articles dedicated to the nuclear age.

Nuclear Weapons Facilities Project. *Makers of the Nuclear Holocaust, A Guide to the Nuclear Weapons Complex and Citizen Action.* 1981. (pamphlet available from Box 291, Nyack, NY 10960)
An informed account of the production and development of nuclear weapons; sections on testing, transportation, deployment; suggestions for conversion to civilian economy.

Schell, Jonathan. *The Fate of the Earth.* New York: Alfred A. Knopf, 1982. Hardback, $11.95.
The first chapter alone is the best and most profound statement of the dangers and consequences of nuclear war that is currently available. Schell contends that our choice is not between peace and war, but peace and annihilation.

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Unforgettable Fire. New York: Pantheon Books, 1977. $7.95
Drawings and paintings by survivors of the A-bomb in Hiroshima, collected thirty years after the event.

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One of a series about the role of the U.N. in promoting disarmament.

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Britain's leading governmental science adviser explains why notions of nuclear fighting are dangerous and illusory, and criticizes the superpower's reliance on deterrence, rather than arms control measures.

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